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"KNOWN, ADMITTED, AND APPROVED" REMEDIES.

THE CHEMISTS' AND DRUGGISTS' DIARY for 1904 will contain a collection of formulas for medicinal preparations in conformity with the requirements of the Special Exemption in the Medicine-stamp Act, 1812, as to qualified chemists—viz.:

All mixtures, compositions, or preparations whatsoever mixed or compounded with or prepared from medicinal drugs, medicated or chemical preparations or compositions, or other ingredients . . . the different denominations, properties, qualities, virtues, and efficacies of which mixtures, compositions, and preparations as aforesaid are known, admitted, and approved of in the prevention, cure, or relief of any disorder, malady, ailment, or complaint incident to or in anywise affecting the human body.

We can receive for inclusion in this collection during the present month from our subscribers formulas for preparations which have not hitherto been liable to stamp-duty, but which in consequence of their ailment-names will on and after December 31 have to pay duty unless the formulas are printed on the label or are otherwise made known. If printed in **THE CHEMISTS' AND DRUGGISTS' DIARY** it will suffice to state on the labels that preparations are so prepared. We do not propose to mention the source of any of the formulas.

Summary.

THIS IS THE EDUCATIONAL NUMBER. We give a series of introductory articles dealing with the pharmaceutical Preliminary examination (p. 310), the new London University examinations (p. 313), Scottish and other medical qualifications (pp. 314 and 315), German scientific training (p. 312), and a method of obtaining the B.Sc. whilst studying for the Minor and Major (p. 311). These are followed by particulars of the pharmaceutical, medical, dental, veterinary, optical, and scientific educational facilities in the United Kingdom and Ireland.

AN ASSOCIATION for Dublin assistants has been formed (p. 296).

AN INTERESTING NOTE on an old Sheffield business is given on p. 295.

ANOTHER saccharin-smuggling case is being investigated at Wigan (p. 295).

METHYLATED SPIRIT is said to be a favourite tipple in the Isle of Man (p. 295).

THE DUKE OF NORTHUMBERLAND is not in favour of the Sheep-scab Bill (p. 340).

THE DUMMY TEAT is one of the causes of the deterioration of national physique (p. 308).

THE Government Laboratory report contains several items of interest to pharmacists (p. 307).

A DRESSING FOR VINES, which injured the plants, cost the supplier 40*l.* in damages (p. 303).

FORTY-SEVEN PERSONS passed the recent assistants' examination of the Apothecaries' Hall (p. 294).

A PARIS CHEMIST was able to give help to some of the sufferers in the underground railway disaster (p. 298).

TECHNICAL SCHOOLS in GERMANY are the subject of a consular report, some notes on which are given on p. 308.

THERE is trouble in Ireland over cod-liver oil, which is so scarce that the workhouse contractors cannot supply (p. 297).

THE IRISH PHARMACEUTICAL SOCIETY have had an acknowledgement of the address they presented to the King (p. 333).

THE HARROGATE CORPORATION have had to pay 250*l.* damages for burning a lady in one of their electro-thermal baths (p. 301).

THE LONDON CHAMBER OF COMMERCE is issuing a reprint of Mr. S. B. Boulton's paper on arbitration in labour-disputes (p. 340).

MR. IDRIS'S PRESIDENTIAL ADDRESS at Bristol has come in for some criticism, but the remarks are confined to disparaging dispensing (p. 308).

"XRAYSER" tabulates the schemes of pharmaceutical reform at present being put forward (p. 305), and has a few words to say on each of the plans.

THE MONTHLY STATISTICS relating to the receipts and deliveries of some of the leading drugs in the London warehouses are printed on p. 346.

A SUCCESSFUL OPERATION—gastro-enterostomy—has been performed upon Dr. Attfield, and the patient is making rapid progress towards recovery (p. 340).

THE NEW REGULATIONS for the importation of sugar are referred to on p. 309, and particulars are given of the requirements of the certificate of origin.

MR. PARRY'S LETTER on the citral value of lemon oil has brought a number of replies from essential-oil experts. These express agreement with Mr. Parry (p. 341).

A SECRET PROCESS for making artificial turpentine and linseed oil has formed the subject of litigation this week. According to Dr. Bernard Dyer, the process is a very valuable one (p. 299).

A FULLER REPORT of the Pharmacy Act prosecution at Glasgow is given on p. 300. The defendant alleged that he was a medical man, but his name was on neither the medical nor pharmaceutical register.

PEARSON'S ANTISEPTIC COMPANY (LIMITED) have undertaken not to use the word "creolin" in connection with their goods until the trial of the action against them by Jeyes' Sanitary Compounds (Limited) (p. 299).

PARKES' DRUG STORES (LIMITED) have been fined 50*l.* and ten guineas costs for selling Blaud's pills deficient in ferrous carbonate. The pills were labelled "Not according to the British Pharmacopœia" (p. 301).

ALTHOUGH business continues quiet in drugs and chemicals, several important fluctuations have taken place. Mercurials have been reduced to meet German competition. Cascarà sagrada and senega are rising articles, and some quantity has been sold "to arrive." Shellac is dearer and active. Cream of tartar and Norwegian cod-liver oil are easier. Quinine and opium are quiet (p. 345).

English News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

Brevities.

Last week a gang of burglars entered the premises of the County Chemical Company in Shut Lane, Moor Street, Birmingham, and stole goods to the value of about 70*l*.

At the annual meeting of the Royal Botanical Society on August 10 it was stated that the new laboratory for the study of botany and horticultural chemistry is serving its purpose admirably.

The annual picnic of the Hartlepoons and District Chemists Association takes place on Wednesday, August 19, to Barnard Castle. Tickets may be obtained from the Hon. Secretary (Mr. A. Timmins, West Hartlepool).

At West Ham Police Court on August 10, Sidney Lush (18) was remanded on a charge of stealing 30 lbs. of old lead from the yard of Messrs. Spencer, Chapman & Messel (Limited), chemical-manufacturers, Silvertown.

At Gainsborough a "passive resister" has, by amicable arrangement with the overseers, allowed the seizure of a quantity of pills, magnesia, and bottles of patent medicines, and it is anticipated that the sale of these lots will furnish some amusement.

At an extraordinary general meeting of the members of the Jenner Institute of Preventive Medicine, held on August 7, under the presidency of Sir Henry Roscoe (Hon. Treasurer), the resolution previously passed to alter the name to the "Lister Institute of Preventive Medicine" was unanimously confirmed.

The Board of Agriculture have made arrangements with the National Physical Laboratory for the examination of the Lister-Gerber milk-testing apparatus. The fees which the Laboratory charge for the work vary from 6*s*. for a test-bottle or pipette with one mark, to 1*s*. 9*d*. for a measuring-glass tested at five points.

The Home Counties Nature-study Exhibition will be held at the offices of the Civil Service Commission (formerly the buildings of the University of London), Burlington Gardens, London, W., from October 30 to November 3. Prospectuses, &c., may be obtained from the Hon. Secretary, Mr. Wilfred Mark Webb, 20 Hanover Square, N.

At Liverpool Assizes on August 7, Solomon Kramrisch (of Kramrisch & Co., Liverpool) was sentenced to twelve months' hard labour for receiving quantities of rubber on account of Kleinwort, Sons & Co., bankers, and fraudulently converting the same to his own use. The frauds were discovered during the bankruptcy proceedings of Kramrisch & Co., whose liabilities were over 100,000*l*.

In a prosecution for motor-scorching at Retford, on August 10, one of the witnesses was Mr. R. B. Atkinson, chemist and druggist, Retford, who stated that he was cycling with his daughter, near Retford, when the accused passed them in his car at a speed which he calculated must have been forty miles an hour. The scorcher was fined 5*l*.

Twelve candidates in the Intermediate Science examination of the London University have passed in purely commercial subjects. Those included tariff policy, foreign trade, Poor-law banking, trade unionism, industrial organisation, money, stock, Stock Exchange, commercial fluctuations, statistics, commercial geography, trade routes, the markets of the world.

The Bermondsey Borough Council, in order to counteract the effects of summer diarrhoea which is responsible for over a hundred and fifty deaths in Bermondsey each summer, have issued posters stating that free doses of diarrhoea-mixture can be obtained at all the police-stations in the borough, and at the Town Halls of Bermondsey and Rotherhithe, in emergency cases.

A mysterious disease at first attributed to smallpox is said to be ravaging Cambridge. A total of 136 cases are reported,

of which 76 are still under treatment. Ten deaths have taken place since July 16, and at Newmarket and Ely, in consequence of the spread of the disease from Cambridge to the villages in the neighbourhood, the Urban and Rural Councils are taking every precaution and making full provision for the prompt isolation of all cases.

At Westminster Police Court on August 10, John Harry Goodwin, managing clerk to Mr. John Saunderson, colonial broker, Mincing Lane, E.C., appeared on remand to further answer the alleged charge of assaulting Mrs. Graham Pearse, widow of the late Major Pearse. The solicitor for the defendant intimated that his client undertook not to go near the complainant, molest her, or in any way approach her in future, and the Magistrate allowed the case to be withdrawn.

Sir Thomas Hanbury, K.C.V.O., whose garden at La Mortola is so well known, has purchased for presentation to the Royal Horticultural Society, the estate and garden of the late Mr. G. F. Wilson, F.R.S., at Wisley, near Woking. The estate is about sixty acres in extent, and well adapted for horticultural experimental purposes. Mr. Wilson had for years been very successful in cultivating hardy plants. Sir Thomas Hanbury is a honorary member of the Pharmaceutical Society and is well known to pharmacists.

Apothecaries' Assistants' Examination.

The following candidates were granted the certificate of qualification to act as an assistant to an apothecary in compounding and dispensing medicines at the examination held last month in connection with the Society of Apothecaries of London: S. F. Barlow, H. Blair, H. Brown, L. Carey, E. J. A. Cavanagh, M. M. Cavanagh, E. N. L. De Larue, G. C. Gammon, A. J. M. Gilkes, R. A. Graham, D. M. Green, J. M. Hague, A. C. Hare, A. M. Hinnell, B. Howard, F. E. Ingle, K. Inglis, E. M. Jackson, A. M. Jones, S. F. Kellett, J. M. Kelsall, C. B. Kibble, D. A. Kimbell, C. L. Latham, S. J. Lewis, K. McD. McCulloch, E. B. Mallet, B. M. Martin, M. R. H. Martindale, G. G. Mulliner, M. L. Orgias, L. M. Owles, L. T. Rogers, E. M. R. Rollason, H. Russell, G. J. Sabine, P. Shekwana, J. F. A. Smyth, A. N. Teague, C. R. Walton, C. F. Ward, E. Wardle, A. B. Wardrop, E. Waring, H. P. Waterworth, E. F. White, H. M. Wilkins.

Birmingham Notes.

The Guardians of Aston have appointed a dentist to the Children's Homes to care for the teeth of the inmates at an annual salary of 25*l*.

Owing to the indefatigable zeal of Professor Hillhouse, the water-lily house at the Birmingham Botanical Gardens is to be reconstructed at a cost of 2,000*l*.

"For gnat-bites 1 part of alcohol and 9 parts of phenol" is recommended as a preventive as well as a pain-reliever in a well-known domestic magazine. "Are not the figures wrong?"

The Poor-law authorities of Wolverhampton have spent 200,000*l*. upon "a new house for the poor" at New Cross, Wednesfield. And up-to-date dispensary, in charge of Miss Hilda Robinson, is one of the features of the new institution.

There appears to be a considerable difficulty in getting a trustworthy *locum tenens* here at present. As a rule the good one is so full of engagements that some who have hitherto had him are "put off" at the last moment. Trade is very quiet.

In a chatty article on "Cheap Jacks," the *Mail* states that a certain "Cheap Jack," who made hundreds of pounds in the Midlands by retailing cough-drops at 3*d*. per box, used to buy his lozenges at 1*s*. per dozen boxes at a wholesale house less than a quarter of a mile from his favourite stall.

A correspondent of the *Birmingham Post* states, with regard to sheep-dips, that the wool-merchants have issued instructions to farmers to avoid the use of lime, sulphur, tobacco, carbolic, and alkaline dips, and to use arsenical dips exclusively, as a better quality of wool is thus obtained.

A Domestic's Death.

An inquiry was held at Truro, on August 6, concerning the death of a domestic servant named Mary Skinner, formerly in the employment of Mr. T. Anthony, pharmaceutical chemist, 12 St. Nicholas Street, Truro. From the evidence it appeared that deceased died at Mr. Anthony's house, and Dr. Laing certified that death was caused by severe hæmatemesis and syncope, following gastric ulcer. A *post-mortem* examination proved the diagnosis to be correct, but after the woman died her father saw Mrs. Anthony and Dr. Laing, and then charged Mr. Anthony with causing his daughter's death. The man deposed that in May of last year his daughter became *enceinte*, and she told him that she went to Penzance under Mr. Anthony's instructions to see a lady doctor, who used an instrument and brought about abortion. Corroborative evidence of the daughter's statement was given by the mother of deceased. Mr. Anthony gave an emphatic denial to the statements alleged against him. The girl told Mrs. Anthony that she was in trouble; he knew nothing of the alleged visits to Penzance. That story was a pure invention so far as he was concerned. After hearing the medical evidence, the Coroner (Mr. E. L. Carlyon) said it was a question whether Mr. Anthony had acted properly or wisely in the matter. As to the statements made by the deceased's father and mother, he believed they told what they believed was true, but whether the girl told a deliberate lie was not to be discovered. It was a question, however, whether Mr. Anthony, who knew what happened in May last year, should not have told Dr. Laing the history of the case when he called him in to attend to the deceased. The jury returned a verdict that death was due to natural causes, and exonerated Dr. Laing and Mr. and Mrs. Anthony from blame.

Methylated Spirit as a Beverage.

The use of methylated spirit as an intoxicant would seem to be as rife in the Isle of Man at present as it was some years ago in the county of Derry. A few days ago the Coroner of Ramsay held an inquest on the body of Emma Cotter. The *post-mortem* examination revealed no signs of violence nor anything consistent with poisoning, but deceased had been a heavy drinker of methylated spirit. Death was attributed to syncope. The Coroner said that was the third inquest he had held upon women where there was direct evidence that methylated spirit was used as an intoxicant. The process by which this spirit was treated was a subject which should be brought under the notice of the Governor of the island.

Sheffield Notes.

Mr. W. W. Sinclair, of Glasgow, has been here during the past week representing the Anglo-American and Continental Pharmaceutical Company, London, &c. Mr. Sinclair lately succeeded Mr. Power.

The applications received for the position of Medical Officer of Health in succession to Dr. E. Robertson, resigned, have been referred to the sanitary sub-committee, with the addition of Councillor A. Russell Fox, chemist and druggist, who will select candidates to appear before the Health Committee.

Mr. Norman S. Goodyer, who has won the silver medal in the Herbarium competition of the Pharmaceutical Society, was also the winner of the Newsholme herbarium prize of the local Society last year. He is the son of a Wesleyan minister, and has been with Mr. G. T. W. Newsholme, of High Street, for three years. He is at present on the sick-list, having been away from business for three weeks.

Sheffielders have been singularly successful in the Herbarium competition, the silver medal coming here on at least one occasion previously, when it was won by Dr. George Harrison. Mr. Hawksworth (another of Mr. Newsholme's staff) took the bronze medal, and amongst certificate-holders were Dr. Tom Collier, of Highfields, and Mr. John Austin, the present President of the local Society.

The annual show of the Yorkshire Agricultural Society was held in Sheffield last week. Amongst the exhibits were those of Spratt's Patent (Limited), "Mandrake" liver-powders, Battle's sheep-dips, and Jeyes' disinfectant. Messrs. Reade Brothers & Co. (Limited), manufacturing

chemists, of Wolverhampton, and Messrs. Day, Son & Hewitt, of London, showed cattle-food and medicines. Thorley's food was represented, and the local firm of Messrs. Newton, Chambers & Co. (Limited) had an enormous stand showing the multifarious nature of their business, in which the manufacture of Izal fills a corner.

The business of Mr. Walter Manuel, of 43 Wicker, which is being now offered for sale under a deed of assignment, was founded by Mr. William Clayton in 1854, and has an interesting history. When the Bradfield dam burst in March, 1864, the water in the shop rose to a height of 2 feet up the counter. It quickly subsided in the shop, but the four cellars were flooded for many weeks. Those were the days when the shares of the water company could be for the price of a pint of beer, and out of consideration for the company Mr. Clayton only put in a claim for 50%, which did not cover the loss by any means. His offer was, with a few others, referred to arbitration, and 30% was accepted out of sympathy with the shareholders. There was, however, some slight compensation afterwards, for the contents of some of the supposed ruined casks were found practically uninjured. Mr. Clayton carried on the business on his own account, and in partnership for a short time with Mr. George Ellinor (now of Spital Hill), until his retirement a few years ago. His photograph was reproduced in the *C. & D.*, April 25, 1893, page 659.

On the Sands.

At Bournemouth the visitors have, besides the orthodox high-class entertainments, two novel amusements that have far-reaching consequences. In one instance the proprietors of Montserrat lime-juice distribute prize-pebbles containing coupons entitling the finder to a bottle of Montserrat lime-juice. One lucky searcher last week discovered a coupon for 2d. A cheque for that amount promptly followed the transmission of the coupon to the proprietors. The sand competitions of Bovril (Limited) also attract much attention. This year the juvenile competitors numbered over a hundred and fifty, and numerous valuable prizes were awarded to the successful sand-artists.

Drugs for the Poor.

At Yarmouth Board of Guardians meeting the question of the drugs supplied to the workhouse was again discussed. The Medical Officer (Dr. H. Collier) stated that he understood the Guardians were somewhat dissatisfied with the cost of drugs, and expected a reduction from him. He admitted that there had been an increase in the cost, which was due to the fact that larger quantities were ordered at certain times. He considered that they might substitute Lofthouse's list for that of the Apothecaries' Hall. The suggestion being made that the stock should be reduced to a minimum simply sufficient to meet present requirements, the doctor stated that he considered that he should always have a supply in stock, and that he would take charge of the drugs (although he was not responsible) and check the invoices. It was considered that, as a first step, stock should be taken of the supply of drugs on hand, and Mr. T. J. Woodcock, chemist, was appointed to perform this duty at a fee of one guinea.

Forgery Alleged.

At the Glamorgan Assizes at Swansea last week, an action was brought by Thos. Williams, farmer, late of Llanon, against his brother, John Williams, chemist, London, for the recovery of 540*l.* on a deed of covenant alleged to have been executed by the father of the parties, the late John Williams, of Penybank Farm, Llanon, three months before his death, which occurred in December, 1901. Defendant alleged that the signature to the deed was a forgery, and counterclaimed for the cancelling of the deed. Plaintiff was neither present nor represented, it being stated that he had left the country. Mr. Gurney, expert in handwriting, said he had compared the signature on the deed with genuine signatures, and was satisfied that the signature on the deed was not a genuine one. The Judge thereupon gave judgment for the defendant on the claim and on the counterclaim, and declared the deed void.

Alleged Saccharin-smuggling.

George Enoch Skidmore, manager of a mineral-water company, was charged at Wigan on August 11, with smuggling

saccharin. Alfred William Starkey, confidential agent of his Majesty's Customs, stated that he saw the prisoner alight from a Manchester train at Wigan station. The prisoner had in his possession a large packing-case, which he subsequently took into a first-class refreshment-room. He there opened the case and took from it a tin containing saccharin, and examined the contents. The witness went up to him and saw that the case was full of tins of saccharin. Being unable to give a proper account of how he came possessed of the saccharin, prisoner was taken to the police-station and charged. In answer to the Magistrates, accused said he thought the duty had been paid on the saccharin, and that if such had not been the case he would not have been fool enough to open the case in the refreshment-rooms. It was stated that the value of the saccharin seized, with the duty, was 336*l*. Bail was applied for, but opposed by Mr. Morton, of Liverpool, who said the case was a more serious one than appeared on the face of it. Eventually prisoner, who was remanded, was granted bail in two sureties of 200*l*. each.

The Use of Embrocations.

At an inquest held at Ilford, on August 6, touching the death of the wife of a commercial traveller named McDougal, it was stated in evidence that deceased had suffered from pains in the chest for which she procured a bottle of embrocation from the local branch of Boots (Limited). Deceased rubbed the embrocation on her chest and side, and it eased the pain, but "the skin swelled up" on the following day. The Coroner (Dr. Ambrose) read the label on the bottle, which stated that the embrocation was a cure for rheumatism, lumbago, sprains, and bruises. He remarked that there was no warning as to the strength of the application, and it smelt very strongly. Dr. Tate deposed to finding deceased suffering from shock caused by the severe burning of her chest, which she told him she had rubbed with embrocation. The burning was extensive and evidently caused by some strong irritant acid. He prescribed for deceased, and she seemed to improve, but a relapse occurred, and she died a few days afterwards. He made a *post mortem* examination, and found that the burns and scars were only superficial. There was an abscess on the lung and 5 or 6 oz. of pus in the pleura. He thought that the abscess had broken up, and thus caused death. He had not analysed the embrocation, but from the smell and taste he concluded that it probably contained glacial acetic acid. The abscess on the lung would be sufficient to cause death, and he did not think there would be any connection between the abscess and the burns. Mr. Watson, manager for Boots (Limited), did not remember who sold the bottle of embrocation in question, but said all three assistants in the branch were qualified. The embrocation was not put up by Boots, and therefore he could not tell its composition, but there were oils, turpentine, and a small percentage of acetic acid. The Coroner thought deceased had probably used the preparation carelessly, without shaking the bottle, and thus used the stronger ingredients which would float at the top, and so received the burns which accelerated her death. Death from natural causes was the verdict.

The St. Louis Exhibition.

Wednesday's *Gazette* contains an Order in Council placing the forthcoming St. Louis Exhibition within the provisions of Section 39 of the Patents, Designs, and Trade-marks Act, 1883, which provides that the exhibition of an invention or a publication of any description of the invention at an industrial or international exhibition shall not prejudice the right of the inventor to apply for a patent. The inventor must before exhibiting give the Comptroller notice of his intention to do so, and the application for registration must be made before or within six months from the date of the opening of the exhibition.

The Week's Poisonings.

Sixteen deaths by poison have occurred during the week, only three being misadventures. Five of the poisons used are unscheduled—phosphorus (match-heads in two cases), hydrochloric acid, sulphuric acid, and salt of lemon. The phosphorus victims were a child at Portmadoc who got hold of some matches, and a young woman at Ossett who suffered from mental aberration. A widow in St. Pancras drank

spirit of salt, and vitriol was taken by a Ramsbottom quarryman. A Lambeth woman purchased pennyworths of salt of lemon in two shops, mixed her purchases with water, drank the lot, and died. The scheduled poisons were hydrocyanic acid (3), opium (3), oxalic acid (3), chlorodyne, and carbolic acid. The prussic-acid suicides were Mr. Reginald Peech, a Rotherham veterinary surgeon (who drank the poison while travelling on the Great Central Railway), a clerk named Benson, living at Lindfield, and an unknown man whose body was found in Savernake Forest. A Walworth carver drank a solution of oxalic acid; a Barry Dock boatman's wife poisoned herself in the same way, and so did Rachel Morgan, of Melynrythan. At the inquest on the last-named, Mr. Ivor Jones, chemist, said he supplied the poison to a little girl, who brought a note from the deceased, asking for sixpennyworth with which to clean hats. He added that oxalic acid was commonly sold, and that chemists were not required to register sales of it. The jury, in returning a verdict of temporary insanity, recommended that oxalic acid should be included in Schedule I. and treated like other dangerous poisons. A Wrexham woman named Robinson obtained 2 oz. of laudanum from Mr. T. C. Richards, manager of Boots' branch at Wrexham, and poisoned herself. The Coroner, at the inquest, suggested that restrictions should be put on the sale of laudanum, and the jury returned a rider to that effect. A Crimean veteran at Louth died from laudanum-poisoning, and an Oldham piecer named David Wild died from the same cause. The evidence at the inquest on Wild showed that he had swallowed a quantity of a "colic-draught" for horses, which Mr. J. D. Arnfield, the veterinary surgeon who supplied it, said was composed of tincture of opium, spirit of ether, nitre, peppermint, and water. An overdose of chlorodyne was inadvertently taken by Miss Capel Cure, daughter of the Rector of Abbots Roothing. At the inquest at West Hartlepool on the body of a woman named Metcalfe, who had taken a fatal dose of carbolic acid, a discussion took place between the Coroner (Mr. J. Hyslop Bell) and Mr. T. D. Pattison, chemist, York Road, West Hartlepool (who supplied the carbolic acid), as to the law on the sale of poisons. The Coroner contended that the sale of carbolic acid should have been entered in the poisons-book, but Mr. Pattison gave the correct view of the legal requirements, with which the Coroner did not appear to be satisfied. The matter was subsequently put right by an editorial note in the local paper, in which the legal requirements regarding the sale of carbolic acid were detailed and Mr. Pattison exonerated.

Irish News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

The Queen Accepts.

A new toilet-soap—the "Queen's Royal Shamrock"—has recently been produced by Messrs. W. H. Bowers & Co., pharmaceutical chemists, 164 Great Brunswick Street, Dublin. A special case of the soap was sent to the Queen while she was in Dublin, and a letter from "The Castle" informed Messrs. Bowers that her Majesty had received the soap and was pleased to accept it.

Replaced.

At the last meeting of the Boyle Guardians, Messrs. Boyers, Medical Hall, Knox Street, Sligo, wrote stating that the syr. ferri phos. c. quiniâ et strychninâ which was unfavourably reported on by the analyst had been replaced by a fresh supply.

A Chemists' Assistants' Association.

Following the movement for the formation of a Chemists' Assistants' Association in Dublin, letters from assistants are appearing in the Cork newspapers expressing the hope that a similar action will be taken in Cork. Mr. Thackeray, the originator of the movement in Dublin, is desirous that the Cork assistants should also fall into line.

On August 5 a meeting of Dublin city and suburban chemists was held in the Gresham Hotel, Dublin, for the purpose of forming an Assistants' and Apprentices' Association. Mr. H. C. Thackeray, L.P.S.I., presided, and there was a satisfactory attendance. The Chairman said he saw no reason to suppose that, once formed, such an organisation should not advance with leaps and bounds, and it was with the object of practically demonstrating this belief that he had come forward in the matter. Messrs. McCarthy, M.P.S.I., Haddock, L.P.S.I., Miller, L.P.S.I., Aplin, Creed, and others, having spoken favourably of the project, it was resolved to start the Association. Mr. Aplin (McMaster Hodgson & Co.) was appointed hon. secretary *pro tem.*, and a provisional committee to draw up rules, &c., were elected. The next general meeting was fixed for August 19, at 8 P.M.

"Divide in Partes Septem."

Dr. Denning submitted a report to the Sligo Guardians last week, in reply to their query, that he had 50 oz. to 60 oz. of quinine still in stock in good condition. Mr. Boyers, Medical Hall, O'Connell Street, Sligo, wrote about the same matter, stating that he could not take the surplus supply of quinine into stock as he already had a very large supply of the drug. The price, he said, was fluctuating, and contractors were compelled to "cover." It was stated that Dr. Denning had been surcharged for the extra supply of this drug, and that the Local Government Board had ordered that the best way to get rid of it was to distribute the drug to the different dispensers in the Union. The apothecary was called upon to divide the supply of quinine into seven parts and to send a supply to each of the dispensaries.

Apothecaries' Hall.

At the annual meeting of the Governors and Council of the Apothecaries' Hall of Ireland (convened by the Statute of Incorporation), held on August 1, the following members were duly balloted for and elected to hold office for the ensuing year ending July 31, 1904: Governor: Arthur Atcock, M.D., M.S.A.U.I. Deputy-governor: F. G. Adye-Curran, M.D., U.D., F.R.C.S.I. Directors: H. A. Auchinlech, L.R.C.P.&S. (Edin.), F.R.C.S.I.; T. T. D. Crinon, L.R.Q.C.P.&S.I.; John Evans, L.R.C.S.; Edward J. Hanrahan, M.B., B.Ch., R.U.I.; Robert Montgomery, M.A., C.S.; Robert J. Montgomery, M.A., M.B., B.Ch.T.C.D., and F.R.C.S.I.; James Raverty, L.R.C.S. (Edin.); Joseph A. Ryan, L.R.C.S. (Edin.); James Shaw, L.R.C.S.I.; G. A. Stritch, L.F.P.S. (Glasg.); C. S. S. R. Stritch, L.R.C.P.&S. (Edin.), L.F.P.S. (Glasg.); C. R. C. Tichborne, P.I.C., Dip.P.H.&L.R.C.S.I., representative on the Medical Council, Secretary: R. Montgomery, M.R.C.S.

"Not Satisfactory."

At the last meeting of the Tuam Guardians a letter was read from Dr. Lambert explanatory of what the Board had termed "disproportionate consumption of medicine" in the Abbey Dispensary district. The Chairman said that for the past three years the consumption was 12%, 4%, and 40%, respectively. He should say that 40% was far too much for one year for the district. He understood that the medical officers must, according to a rule of the Local Government Board, send in a requisition for medicine every three months. If so, the Local Government Board were treating the rate-payers very badly, as the medicine in stock would go to loss. Mr. McDonagh (Clerk): Well, that is the order, to have fresh medicine. There need not be much ordered at a time; if it were only a bottle of castor oil, the order would be complied with. Mr. Thos. Costelloe: If the dispensary books, brought here periodically, were examined, couldn't we find out how the disproportion occurred? Mr. P. J. Costelloe: No; the doctors have the whip-hand of you there. I shall mark the explanation "Not satisfactory." The Board made an order accordingly.

Not up to Standard.

At the last meeting of the Clonmel Corporation Sir Charles Cameron reported that he had analysed for the Board of Guardians thirteen samples of drugs. One of the drugs (syrup of ferrous iodide) contained a slight excess of iodine. The Corporation took no action in the matter.

The Cod-liver Oil Famine.

At the Drogheda Guardians' meeting last week a letter was read from Mr. P. White, pharmaceutical chemist, Sligo, stating that if the medical officer of the Duleek dispensary returned the supply of cod-liver oil he would substitute a fresh supply for it.

At the last meeting of the Longford Guardians a letter was read from Dr. McGuire to the effect that he had ordered 2 gals. of cod-liver oil from the contractor, but only 1 pint was sent him, which was entirely insufficient for his requirements. Dr. McCarn (who was present) said his experience was similar, and he had been obliged to get his medicine elsewhere. Mr. Molloy: Let the doctor get it locally and charge the difference in price to the contractor. Mr. Carney: Why has not the letter of the Local Government Board been adhered to? They told us that this commodity was scarce this season, and that it should be used sparingly. The Clerk: Dr. McGuire says there are a lot of consumptive patients in the infirmary who are being kept back for want of this oil. The Chairman suggested that, in justice to the contractor, the doctor should get only a small quantity locally. Regarding the price, the Clerk said the last gallon they got was charged 17s. 10d., and the contractor said he could not afford to pay the difference between that and the contract-price, but that he would carry the matter on to the next account. Several members thought that the contractor should be held to his contract, and compelled to supply it; and it was ultimately agreed that the Clerk write to the contractor that day, stating that unless he supplied the cod-liver oil at once it would be procured elsewhere at his expense.

Defective in Quality.

The Local Government Board has written to the Granard Guardians pointing out that, according to the analysts' report, some of the samples of medicine are of a defective quality, and they urge on the Guardians to see that the drugs are replaced by a fresh supply of the proper standard.

Fire.

On August 8 a fire occurred in the fluid-magnesia works, Graham's Court, Dublin, the property of Sir James Murray & Sons. The one-storey building was gutted, and its contents destroyed.

Samples for Analysis.

The Local Government Board has decided that dispensary medical officers must in future forward samples of medicines by post, prepaid, to the Clerk of the Union for analysis. They can afterwards look to the Guardians for recoupment of the postage.

Scotch News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

A Wedding-gift.

At a meeting of the Linlithgow Town Council, on August 4, Provost Jamieson, on behalf of the members of Council, presented Bailie Spence, chemist and druggist, with a handsome timepiece in commemoration of his marriage.

A New Start.

Mr. Alexander Fraser, chemist and dentist, who retired in ill health from "South Morningside Pharmacy," 84 Coniston Road, Edinburgh, has built and opened an up-to-date pharmacy, with dark room, &c., also dental department, at West Linton, a favourite health-resort in Peeblesshire.

Poisoning-cases.

A young woman named Brown poisoned herself at Leith on August 6 by drinking an infusion of match-heads obtained from a dozen boxes of matches.—On August 10 William Alexander, hotel-keeper, Tannadice, formerly of Laird & Alexander, rubber-merchants, Dundee, was found suffering from laudanum-poisoning in a Dundee hotel. On the dressing-table of his bedroom were two bottles, labelled

"Poison," which had been drained of their contents. The bottles bore the names of two different chemists in the city. The man was removed to the infirmary.

A Money-lending Transaction.

In the Duns Sheriff Court, on July 31, the record was closed in an action by George Philip Ross, chemist, Hawick, executor for the late William Rose Ross, chemist, Hawick, against Sir William Francis Elliott, Bart., Maines, Chirnside. Plaintiff sues the defendant for 133*l.* 8*s.*, being money lent in various sums at various times to the defendant by the late Mr. Ross, to help him out of difficulties in which he had been involved by losses in betting-transactions. The defendant pleaded prescription, and explains that all the transactions were founded on, and many others, which took place between the deceased and himself had reference to betting on horse-races, all of which were settled before the defendant left Roxburghshire to reside in Berwickshire, and no claim therefore was ever intimated to the defendant until shortly before the institution of the present action, and such was repudiated. The Sheriff appointed the hearing at the first interim court.

Glasgow Notes.

Prices are being cut down to the bone. In certain districts all unprotected proprietaries are being distributed at cost.

The Assistants' Association is already preparing for the winter session. Mr. Bewglas, its enterprising Secretary, is actually importuning men just home from holidays for the titles of their papers.

Local opinion is, on the whole, in favour of Mr. Tocher's elaborate and exhaustive scheme of territorial representation. His proposals are the subject of frequent and animated discussion amongst local chemists.

Mr. Tocher's statistics as to the ratio of chemists to population are instructive in many ways. If the number of chemists in business be taken, the ratio is of course smaller. In Glasgow the proportion is 1 to 5330—a figure which is eloquent as to the sinister interference of doctor's shops.

In a current newspaper correspondence on nursing-homes, it is pointed out that there is a pressing need for private hospitals for paying patients of the upper working-class and lower middle-class type. The public-hospital charges for paying patients are prohibitory.

A Glasgow clergyman who has just returned from a trip to America has been lecturing on his travels. He mentioned incidentally that, in doubt about anything when abroad, he makes it a rule to consult the nearest chemist. In his experience the chemist is always one of the best-informed and most obliging of business men.

French News.

(From our Paris Correspondent.)

THE CREDITS necessary for the new laboratories at the Paris School of Pharmacy were voted by the Council of Paris University at their last meeting.

VIPER'S VENOM, M. Phisalix told the Academy of Sciences at a recent meeting "is not a poison for its own species in the natural conditions of inoculation." Lord and Lady Kelvin, by the way, were present at this sitting, and were warmly welcomed.

THE EARLY-CLOSING MOVEMENT.—The pharmacists of the fashionable 8th (or Champs-Élysées) arrondissement of Paris have agreed to close at noon on Sundays from July 14 to October 1. It is stated they also contemplate shutting half an hour earlier nightly during the time their wealthy clients are away at the country and the seaside.

THE PELLETIER-CAVENTOU MONUMENT.—The accounts of receipts and expenditure connected with the Pelletier-Caventou monument have recently been published, and show that the total of the subscriptions received amount to

42,100*l.* (1,684*l.*), and the outlay reached a similar sum. All the leading associations connected with pharmacy in Europe figure on the list, as well as the American Association of Pharmacy, but of course the bulk of the amount was collected in France. A record of the work of the committee who undertook the erection of the monument, which, it will be remembered, was inaugurated in Paris in 1900, has been lodged in the archives of the *Chambre Syndicale des Pharmaciens de la Seine* at Paris by M. de Mazières, to whose initiative the monument was due.

THE POET AS A THERAPEUTIC PROPHET.—A French journalist, writing on radiotherapy, reminds us that Goethe "divided colours into positives and negatives—yellow, orange, and red stimulate and excite; blue, violet, and green depress." Modern medicine, he states, has transformed the poet's vision into serviceable fact; and he alludes to the radium cure of cancer at Charing Cross Hospital.

THE PARIS TUBE DISASTER.—Several persons, half-suffocated on the fearful railway disaster that occurred on the Paris Metropolitan Railway on August 10, were carried to the establishment of M. Toledo, a pharmacist in business on the Boulevard de Belleville. They were restored by means of careful treatment, and, thinking that other sufferers might follow, M. Toledo kept his pharmacy open all night. At half-past two in the morning a fireman in a state of semi-asphyxiation was taken to M. Toledo's house, and was only revived with considerable difficulty. Afterwards M. Toledo accompanied M. Lepine, the Prefect of Police, as far as the platform of the station where the catastrophe occurred, and he declared that the spectacle they witnessed was awful. Dr. Bordas, assistant director of the Paris Municipal Chemical Laboratory, interviewed by the *Matin*, has expressed the opinion that the death of the victims must have been instantaneous. "Death may have been brutal," he said, "but it was as sudden as the knife of the guillotine, and there was no suffering."

South African News.

(From our own Correspondents.)

A PATENT has been applied for in the Cape Colony for an invention "for applying liquid or paste dip or other chemicals to sheep, goats, or other animals," by Sidney MacDougall, manufacturer, East London, C.C.

REPRESENTATION AT ST. LOUIS.—It had been proposed to grant the sum of 10,000*l.* towards the representation of Cape Colony at the St. Louis Exhibition; but in the debate on the Estimates in the House of Assembly on August 7 the motion was expunged.

THE CUSTOMS UNION.—The new Customs Ordinance which was unanimously passed by the Legislative Council of Southern Rhodesia has been assented to by the High Commissioner, and was promulgated on August 7. The Convention comes into operation on August 15.

THE WALKING-CRAZE has evidently reached South Africa, for the chemists and druggists of Cape Town met together on July 20 at the Royal Hotel, Plein Street, to arrange a walking-competition between the employés of Messrs. Heynes, Mathew & Co., Lennon (Limited), and P. J. Petersen & Co. A committee was formed, and officers appointed to carry out the necessary details for the match.

CAPE ANALYST'S REPORT.—The report of the senior analyst for Cape Town (Mr. Charles F. Juritz) for the quarter ended March 31 states that, among other things examined, were one sample of cream of tartar, fourteen samples of olive oil, seven samples of Gregory's powder, and ten samples of glycerin. Of these, four samples of olive oil were found to be adulterated with cotton-seed oil, two to the extent of 71 per cent., one by the addition of 76 per cent., and one 90 per cent. Two of the Gregory's-powder samples were also adulterated; one contained 22 per cent. of basic carbonate of magnesium, and the other 48 per cent. All the other drug-samples were genuine.

Legal Reports.

High Court Cases.

CHRISTY v. TIPPER.

In the Chancery Division on August 7, before Mr. Justice Kekewich, Mr. E. P. Hewitt moved for an order directing a commission to go to the United States for the examination of witnesses on behalf of the plaintiff. The action was one to restrain the defendant from using the word "Absorbine" in connection with certain veterinary preparations. Plaintiff was a manufacturer carrying on business in the United States, and the defendant was his agent for sale in this country. The latter was a manufacturer of veterinary goods, and one of the articles was sold as "Absorbine," which had been substituted for the word "Absorbent." The plaintiff registered in this country the word "Absorbine," and the case for the defendant was that until an advertisement appeared in December, 1892, he had no knowledge of what the plaintiff had done, and upon it coming to his knowledge he wrote complaining of the adoption of the word. The plaintiff, however, then commenced an action to restrain the defendant from using this description, and defendant replied by a motion to have the mark removed from the register on the ground that "Absorbine" was not an invented word, and was common to the trade. It was the defendant's submission that no case had been made out for a commission, and that it would entail unnecessary expense, and that evidence necessary for the plaintiff's case could be obtained in this country. After argument, his Lordship declined to vary the order directing a commission, and dismissed the motion.

In the Court of Appeal on August 12, the defendants appealed from the decision of Mr. Justice Kekewich. Their Lordships declined to accede to the application for an order directing a commission to issue to the United States.

THE "CREOLIN" TRADE-MARK.

In the Chancery Division on August 7, before Mr. Justice Kekewich, Mr. Ruegg, K.C. (with him Mr. C. C. Scott), mentioned the case of Jeyes' Sanitary Compounds (Limited) v. Pearson's Antiseptic Company (Limited). The plaintiffs in this case sought an injunction to restrain the defendants from printing and publishing in the *British Medical Journal* or otherwise issuing an advertisement or statement indicating or implying that the disinfectant manufactured by them was the plaintiffs' goods, and also from using in connection with the sale of any goods not manufactured by the plaintiffs the word "Creolin" or "Creolin Pearson." The defendant Pearson was from the year 1888 agent for the plaintiffs to sell their goods and disinfectants under the name of "Creolin," and by the agreement he was entitled to sell under that name in all parts of the world. The agreement remained in force until March of this year, when plaintiffs found out that the defendants had commenced to manufacture "Creolin."

Mr. Justice Kekewich asked if the motion was going to be threshed out.

Mr. McCall, K.C., for the defendant, said he had no objection to a speedy trial, but if the motion was to be proceeded with he should submit that the matter was not one in which an injunction should be granted.

Mr. Justice Kekewich: You have indicated that there will be a considerable conflict of testimony.

Mr. McCall said there was a conflict of evidence, and in a trial before Mr. Justice Wright three or four days were occupied.

Mr. Ruegg said the case was of great importance, and they were anxious that it should be disposed of. He did not think there was any conflict of evidence. He was willing, if his learned friend would give an undertaking not to use the word "Creolin" or "Creolin Pearson" in connection with his goods, and a speedy trial was arranged for, not to proceed with the motion.

Mr. McCall said he was willing to give an undertaking without prejudice, and it was agreed to have pleadings and plead in the vacation if it could be arranged.

A SECRET PROCESS.

In the King's Bench Division on August 7, the action of the Société Chimique Roubaissienne v. Sherrin came up for further hearing, before Mr. Justice Wright, sitting without a jury. The action was to recover a sum of 5,000*l.*, stated to have been advanced to the defendant by plaintiffs, in order to enable him to carry out a secret process for the manufacture of artificial turpentine and linseed oil at Southall, Middlesex, and damages for alleged breach of contract—in all, 7,239*l.* The case was before his Lordship some time ago, and was adjourned in order to receive a report as to the value of the process, the premises at Southall, &c.

Mr. Montagu Lush, K.C., and Mr. E. C. Leck appeared for plaintiffs, a chemical manufacturing firm at Roubaix; and Mr. T. Terrell, K.C., Mr. Shearman, K.C., and Mr. E. Hills were counsel for defendant.

Mr. Lush, in re-opening the case for the plaintiffs, said that by a contract dated December 20, 1901, the defendant agreed to grant to the plaintiffs the exclusive use of a certain secret process which he represented that he possessed for the manufacture of artificial turpentine and linseed oil. It was represented that the cost of the products would not exceed 40*l.* per 100 kilos., which would leave a net profit of 10*l.* per 100 kilos. A factory was to be established at Southall at a cost not exceeding 50,000*l.*, exclusive of the purchase of the land. The defendant was to attend and manufacture and sell all the products without any salary, but all purchases and sales and every transaction were to be in plaintiffs' name, and accounts were to be paid every three months. It was also provided that if the results were not as stated by the defendant he was to repay to the plaintiffs all the money spent by them on the purchase of the land, buildings and premises, installations, &c., and fully indemnify the plaintiffs for the sums laid out on the premises, with interest. He had also to deposit a document containing his secret process with the secretary of the company at Roubaix. The plaintiffs stated that from time to time they advanced to the defendant 5,000*l.* in connection with the providing of the factory, &c. He had leased certain temporary premises at Southall, but he had failed to establish a factory, or to make the products by his alleged secret process, or to account for the expenditure of the 5,000*l.* They claimed that sum and damages for breach of contract—in all, 7,289*l.* and interest. Counsel then read lengthy correspondence which had taken place between the parties.

His Lordship said the main question appeared to be whether the installation had failed, and whether plaintiffs were justified in treating the contract as at an end.

Mr. Leck said that was so. He called

Mr. Dillie, director of the plaintiff company, who gave evidence bearing out the facts as stated in the claim.

Cross-examined by Mr. Shearman, he denied that anyone on their behalf had attempted to steal defendant's secret process.

Mr. Shearman suggested that the question of accounts and of the secret process should go before an official referee. The process was, as shown by Dr. Dyer's report, a very valuable one, and could not be disclosed in that court. The fact was that plaintiffs had attempted to steal it by taking possession of the works. He suggested that his Lordship should only deal with the plaintiffs' claims to exclude the defendant from the works, and to have their money back.

Mr. Leck said his case was that the plaintiffs never had communicated to them the secret process.

His Lordship said the only thing they could effectually deal with then was whether plaintiffs were entitled to get their money back, and they would have to hear the evidence of Mr. Sherrin.

Witness, further cross-examined, admitted that the manufacture of the products had been carried out since July, 1902, and some had been sold at 25*l.* a ton. He admitted that they wrote to the defendant stating that if he started to manufacture before insuring the premises, &c., they would hold him responsible. He denied that his company had endeavoured to obtain possession of the secret process of the defendant.

Mr. Pollet, another director of the Société Chimique, gave similar evidence.

Mr. John Sherrin said he entered into the contract in question with the plaintiffs, and made experiments with the

products in their presence. He got a lease of ground at Southall in 1932 and engaged an architect and contractor, and did all he could to have the factory completed as soon as possible. The building was completed by the end of May, and it was so far completed in April that he made 9 tons of the products, which he sold for 208*l*. There was a disturbance when plaintiffs took possession of the works in July 1902; brickbats were thrown, and he was fired at with a pistol. In June he was ready to make 9 tons a day. The process, which was a successful one, was still his secret. He was quite ready to go on with the manufacture, and he considered that he was losing 30,000*l*. a year by not going on with it.

His Lordship, in giving judgment, said he did not think the plaintiffs had made out their claim for the return of the money advanced for the factory. That was the only question he had to deal with, and the question of account between the parties must be referred to some other tribunal. The first contention of the plaintiffs was that the process was a failure, but he had a report from Dr. Bernard Dyer, a high authority, that it was not a failure, but a valuable process, and that the works were capable of turning out the quantity named in the contract at the cost named. He did not think that under the circumstances there had been any unjustifiable delay. He found that the money could not be recovered. Judgment therefore for defendant, the question of costs to be reserved.

Mr. Shearman said that in any event his client would be entitled to costs, and he asked for an order that plaintiffs should not part with the works until the costs were paid.

An undertaking was given by Mr. Lush to the effect that the works would not be disposed of without communicating with the defendant.

MINERAL-WATER LABELS.

In the Chancery Division on August 7, in the action of Schweppes v. Gibben & Co., Mr. Justice Byrne heard a motion on behalf of the plaintiffs for an injunction to restrain the defendants, who carry on business at Plymouth, from infringing the label the plaintiffs affix to their bottles of mineral waters. The defendants denied the infringement.

Mr. Levett, K.C., put in the bottles and labels of the plaintiffs and the defendants, and submitted that the label of defendants was so similar to that of the plaintiffs as to be calculated to deceive and enable the defendants' soda-water to be passed off as that of the plaintiffs. In his view, the defendants' label was simply a copy of the plaintiffs', the colour (chocolate), printing, lettering, and border being practically the same. The evidence of confusion created by the defendants' label was afforded by the fact that defendants' soda-water bottles had been returned empty to the plaintiffs by different customers, and the resemblance then discovered was only too palpable. Affidavits were read in support of the motion.

Mr. Rowden, K.C., read the evidence in reply on behalf of the defendants, denying there was any such resemblance as to create confusion, and pointing out that the defendants' bottles were distinguished from the plaintiffs' not only by the fact that the plaintiffs' were stamped with the word "Schweppes," but that the defendants had no label over the cork. The colour, it was said, was common to the trade, and the word "Gibbens" prevented anyone supposing that defendants' goods were those of the plaintiffs'. It was possible there might be a mistake made by an employé, and returned empties of other manufacturers had been sent to the defendants, who had consequently had recourse to the Bottle Exchange to recover their own bottles.

Mr. Justice Byrne suggested that the defendants should undertake to keep an account, and said he would facilitate an early trial.

Mr. Rowden consented to this.

It was then arranged that pleadings should be delivered in the vacation, the defendants keeping an account of sales by them, and no order was made in the motion except that costs should be costs in the action.

Pharmacy Acts.

"DR. OWEN."

As briefly reported in last week's issue (page 276), a pharmacy prosecution of an unusual character took place at Glasgow.

The case was heard on August 6, at the Glasgow Sheriff Court before Sheriff Mackenzie. The respondent, Richard Jones Owen, 145 Duke Street, Glasgow, was charged at the instance of the Registrar of the Pharmaceutical Society with a breach of the Pharmacy Act, inasmuch as the respondent, not being a duly registered pharmaceutical chemist or chemist and druggist, sold by retail 2*z*. worth of laudanum.

Mr. Morison, S.S.C. (Edinburgh), appeared on behalf of the prosecution; and respondent, who pleaded not guilty, was defended by Mr. J. L. Mackie, writer.

Mr. Morison stated that in view of the defence intimated he had cited the respondent to produce a certificate from the Registrar of the General Medical Council, to show that he was a qualified medical practitioner. It would be quite a good defence if such a certificate were produced.

Mr. Mackie assured the Court that he would not found his case on such a defence.

Mr. Morison: A certificate was exhibited to one of our officers, and as I have no notice of what the defence is, I am not going to imperil my case by allowing any part of the evidence to be withheld.

The Sheriff: I don't see that it enters into this case at all. You are here to prove that the respondent sold opium, and you call upon him to produce a medical qualification.

Mr. Morison: If he were a qualified medical practitioner, he would be entitled to get off; and I contend that I am entitled to see this certificate, especially as it has been produced to one of our officers.

The Sheriff: Suppose you got the document, what do you want to show?

Mr. Morison: I want to show that it does not apply to this gentleman.

The Sheriff: And suppose he says he won't give it to you, what then?

Mr. Morison: Then I ask you to order him to do it. If he does not, he brings himself within the jurisdiction of your Lordship.

Sheriff Mackenzie said that looking to the fact that Owen was respondent in this complaint, and that he could not therefore be called as a witness for the prosecution, he must refuse the application.

Evidence was then given by

Mr. John Rutherford Hill, who stated that he called at respondent's shop to investigate a complaint against him. The sign on the outside wall of the shop was "Chemist." H. Slogie, Druggist"; on the shop door were the words "McEwan & Co."; while on the door of a small consulting-room was a brass plate bearing the name "Dr. Owen" in large letters. Respondent said his full name was Richard Jones Owen. Witness asked him if he was a duly qualified medical practitioner, and he replied that he was. Witness told him that he had failed to find his name on the register of medical practitioners, and respondent replied that he had been in the Army and also in Australia, and had in consequence allowed his name to lapse from the Medical Register, adding that he would take steps to have his name restored. Witness explained to Owen that if he could prove that he was a duly registered practitioner, there could be no prosecution against him. Respondent showed him a Medical Directory for 1898, and pointed out an entry there of the name of Richard Jones Owen, 123 Farmworth Street, Liverpool, as qualifying in 1861. He said that entry referred to him. He then showed witness a sealed certificate bearing the name of the Registrar of the General Medical Council, and indicating that the person named on the certificate had been registered in January, 1862. He said that was his certificate as a medical practitioner. Witness made inquiry of the Registrar of the General Medical Council, and received the following reply:

July 23, 1903.

Referring to your letter of 22nd inst., investigation shows that in 1890 Richard Owen, who alleged himself to be Richard Jones Owen, fraudulently obtained restoration to the Medical Register by assuming the latter name, and, the circumstances having been examined, his name was erased on May 28, 1890. The address then given was 123 Farmworth Street, Liverpool, and the assumed qualification M.R.C.S.Eng., 1861; L.S.A., 1861. I believe that a prosecution was impossible, owing to his leaving the country.

Yours faithfully,

H. E. ALLEN (Registrar).

Mr. Hill produced the chemists' register, which did not bear Owen's name. Respondent said he had qualified to

enter for the Modified examination of the Pharmaceutical Society. He claimed to have been an assistant at the time of the passing of the Act, to have been three years at the business, and to have been then twenty-one years of age. Witness found from an old list of candidates for the Modified examination that one named "Owens" had gone up in 1871, and failed to pass. Although the name was Owens, the address was the same as given by respondent to witness on calling at his shop. In consequence of those investigations, witness took steps to have a purchase of poison made at respondent's shop. This purchase was labelled "Laudanum," and contained 16 gr. of opium, or several fatal doses.

Respondent's agent handed witness a blue document, and asked him if it did not show that his client had passed in chemistry and materia medica with honours.

Witness replied that he did not think it showed anything of the kind.

Mr. Mackie: Is it not the fact that Mr. Owen has but to pass the Modified examination to qualify him to sell any kind of poison?

Witness: This document has nothing to do with the pharmaceutical qualification.

Mr. Mackie: Is it not a certificate admitting him to the Final examination, giving him a triple qualification for Scotland?

Witness: Is it a mere admission to a medical examination. It is not a qualification of any kind.

Joseph Tait corroborated Mr. Hill's evidence regarding the analysis, and Mrs. Ellen McKellar gave evidence of having made the purchase of laudanum. She said that respondent was in charge of the shop. Upon asking for the article, Owen wanted to know what it was for. Witness replied that she sometimes used it for cleaning. He had some hesitation in selling it to her, saying that if he knew the person he would not mind selling as much as 2s. worth; but he sold her the laudanum.

Corroborative evidence was also given by Andrew Miller Stewart.

Respondent, giving evidence on his own behalf, said the incident happened when he had had the shop about two months. To look after the shop he engaged a duly qualified and registered chemist, who left because he suffered from heart-disease. In response to an advertisement he got another qualified man, whom he was under the necessity of dismissing because of drunkenness. He advertised for a third qualified man, and it was while he was unassisted that the last two witnesses visited his shop. During the period he had no assistant he was very careful not to dispense poisons unless to persons he had every confidence in. He had passed an examination in chemistry and materia medica, and he had only to pass the Modified examination of the Pharmaceutical Society to enable him to dispense poisons.

In cross-examination, respondent gave "Maxwell" and "Ralston" as the names of the two qualified assistants he had had.

Is it not the fact, asked Mr. Morison, that you appeared in London to pass this Modified examination?

Respondent: I believe I did.

Why did you take the name of Owens?—I cannot tell you. It is a common thing in Wales for people to call themselves Owen or Owens.

Were you ever at 128 Farmworth Street, Liverpool?—I was staying there, but I had no residence there.

You have heard the evidence of Mr. Hill. I want to know if you admit that you showed him a certificate from the Registrar under the Medical Acts, and made claim that you were entitled to sell poisons?—I did not claim anything of the kind.

The Sheriff said he thought this line of cross-examination should not be pursued further.

Mr. Morison: I think you now admit you have no qualification to sell poisons?

Respondent: No registered qualification.

This was all the evidence, and, after the solicitors had addressed the Court,

Sheriff Mackenzie said he had no hesitation in finding the charge proved, and imposed a fine of 3*l.*, with two guineas of expenses. The alternative, in default of payment, was twenty-one days' imprisonment.

The fine was paid "under protest."

Electro-thermal Baths.

AT Leeds Assizes on August 10 Mrs. Bessie Bocquet sought to recover damages for personal injuries from the Harrogate Corporation, as owners of the Royal Spa Baths, the Medical Electro-thermal Generator Company, and Mr. Arthur Greville, its manager. The case for the plaintiff was that she suffered from lumbago, and Dr. Wood, her medical attendant, advised her to go to Harrogate and try the baths there. On getting into the bath at Harrogate the bottom part of her back was subjected to electro-thermal application. Plaintiff had not been in the bath long when, she said, she turned to the nurse in charge and told her she was being burnt. During the night a large blister formed on the part that was burnt. The blister broke, and the wound got worse, so that three doctors had to be called in. The wound was obstinate and gave her great pain. The contention of plaintiff's counsel was that there was either some defect in the bath itself, or negligence on the part of the nurse. The nurse deposed that the temperature of the bath the plaintiff had was never more than 38° degrees; and Mr. Greville said 5,000 or 6,000 persons had been treated by the bath in question and no complaint made. After hearing various other witnesses, the jury found for the plaintiff, and assessed the damages at 250*l.* Judgment was given accordingly.

Sale of Food and Drugs Acts.

BLAUD'S PILLS.

AT North London Police Court on August 7, before Mr. Mead, Parke's Drug-stores (Limited) were summoned by the Islington Borough Council for having sold at their branch establishment, 804 Holloway Road, N., iron tonic pills (Blaud's formula) which were not of the nature, substance, and quality demanded, inasmuch as they were 75 per cent. deficient in ferrous carbonate. There was a second summons for offering pills as Blaud's formula which did not come up to that description. The case had been adjourned to enable the defendants to have an independent certificate from the analysts at Somerset House, and this was said practically to agree with that originally given by Dr. Frank Teed, public analyst for Islington. This certificate said that there was only 4.3 per cent. of ferrous carbonate present, and, allowing for deterioration, never more than 8.4 per cent., instead of 20 per cent.

Mr. Bramall, who prosecuted, in a lengthy opening asserted that anæmic people taking pills of the strength of those in question would find no appreciable benefit. From a medicinal point of view the pills were practically valueless.

Inspector Ward proved the purchase. He said that he asked for a bottle of "iron pills." The assistant said, "Blaud's?" and he (witness) replied, "Yes; that will do." He paid 1*s.* 4*d.* There were two labels on the bottle—(1) "Iron pills; Blaud's formula," and (2) "These pills are not prepared according to the British Pharmacopœia."

Cross-examined by Mr. Bonsey (counsel for defendants), witness said he had bought Blaud's pills before, and thought 1*s.* 4*d.* was rather a high price. He had paid 6*d.*, 8*d.*, and 10*d.*, but never 2*s.* When he went to the shop he intended to buy iron pills—not necessarily Blaud's. He did not say, "That will do in place of the British Pharmacopœia iron pills."

By the Magistrate: The seller did not, until the purchase was complete, draw witness's attention to the labels. He had paid for them and got the bottle, but could not see the labels as the bottle was in a cardboard case. He expected to get iron pills compounded according to the British Pharmacopœia.

Mr. Frank Teed, D.Sc., of 9 Mincing Lane, said he made the original analysis. He was familiar with the iron pill of the British Pharmacopœia. He knew the Codex, which was the Pharmacopœia for France. That gave Dr. Blaud's formula.

Mr. Mead: What is Blaud's formula?

Dr. Teed: I have worked it out, and find that it practically agrees with the iron pill of the British Pharmacopœia, with 20 per cent. of ferrous carbonate as the essential element. It is a specific for anæmia—to supply iron to the blood. There was a difficulty in getting iron into the system before this discovery of Dr. Blaud, an eminent French physician.

But this makes the iron easily assimilated. These pills, which contained 4.3 per cent. of ferrous carbonate, would be practically valueless to the patient, because the percentage of iron is so small.

By the Magistrate: The ferric oxide should not be there at all in a properly compounded pill. That would arise from a deterioration of the pill, and from the pills being stale.

Cross-examined: I am not a medical practitioner. Ferric oxide is used in pharmacy. Bland's formula is a well-known remedy amongst chemists and medical men.

By the Magistrate: There is no entry in the present edition of the British Pharmacopœia as to Bland's formula, but there is in a previous edition. Apparently that formula was copied from the French Codex of 1866, the editor of which obtained it from a formula contributed by Dr. Bland himself to *Le Bulletin Général Thérapeutique* of 1831, the official organ of the French Academy of Medicine.

Mr. Bonsey: Bland's is only a name now for an iron pill. In the current British Pharmacopœia there is no reference to Bland's name. Bland's formula has been published in France. There are many Bland's formulas. There is one in Germany, another in Austria, a third in America.

Dr. Teed: They do not differ in the essential 20 per cent. of ferrous carbonate. What we understand as Bland's formula is that which is given as the iron pill in the British Pharmacopœia. Nine out of ten experts would say so.

Mr. Bonsey: And what would the tenth say?

Dr. Teed: Some might use potash, and others soda, in the manufacture; but that would not affect the essential ingredient—iron.

By the Magistrate: All the formulas attributed to Dr. Bland practically agree in the essential 20 per cent. of iron.

Mr. Bonsey: Was Dr. Bland the inventor of the iron pill of the British Pharmacopœia?

Dr. Teed: The inventor of the carbonated-iron pill. It is the name given to pills containing carbonate of iron of a certain strength.

Mr. Bonsey: A general designation. And if anybody showed you a pill under any other name, and said, "That contains 20 per cent. of iron," you would not say it was according to Dr. Bland's formula?

Dr. Teed: The same result may be arrived at in different ways. I do not know that anybody has any proprietary rights in Dr. Bland's pills. It was a formula presented to the world by Dr. Bland. Beecham's pills are a proprietary medicine, and I should not like to make a pill and offer it for sale as Beecham's.

Mr. Mead: If you can prove that this is a proprietary medicine there may be something in it, Mr. Bonsey.

Mr. Bramall: Would a Bland's pill with 4.3 of ferrous carbonate be right?

Mr. Mead: Or even with 8.4?

Dr. Teed: No. And with regard to the proprietary rights, I do not know that Dr. Bland's nephew, who is now in the South of France, claims any rights in the formula.

Mr. Bramall: Bland's formula was originally in the British Pharmacopœia, and when the name was dropped there was substantially the same formula left in for the iron pill. The only difference is the coating.

Mr. John Humphrey said he was "a practical pharmaceutical chemist." He had ascertained what was Dr. Bland's original formula. He knew that Bland's formula had been in the British Pharmacopœia; and that substantially the iron pill of the day was Bland's, with 20 per cent. of ferrous carbonate. He found the original formula in the library of the Royal College of Surgeons. It was in the *Medical Journal* of 1836. He knew there were various formulas called Bland's, but the original was used in France. In England it was improved upon in order to make the pill keep better, but the proportion of ingredients was the same, and the proportion of iron the same, with a variation of 1 or 2 per cent.

By Mr. Bonsey: If I were in business now, and were asked for an iron pill, I should dispense it according to the British Pharmacopœia. If a man came in and said, "I want Bland's pills," I should prepare them according to the British Pharmacopœia. In any case, it would not be strictly in accordance with Bland's original formula.

Mr. Bonsey said this was a proprietary medicine, and the Borough Council had no right to interfere; but

Mr. Bramall said anybody could make a Bland's pill with 20 per cent. of ferrous carbonate in it.

Mr. Joseph Ince, pharmaceutical chemist, for fourteen years lecturer on pharmacy to the Pharmaceutical Society, said he had investigated the history of the method of the preparation of Bland's pills. Dr. Bland was the head physician at the Hospital of Beaucaire and a corresponding member of the French Academy of Medicine. Bland's formula was perfectly well known. It was ferrous carbonate formed in the process of pill-making. The proportion of ferrous carbonate should be 20 per cent.

Mr. Bonsey: You have only gathered your knowledge from reading books?

Mr. Mead: Now, tell me again what you consider the essential element.

Mr. Ince: It is ferrous carbonate, which is generated, and which should be present to the extent of 20 per cent.

By Mr. Bonsey: I have had nothing to do with the manufacture of such pills. It is not Bland's pill if it does not contain 20 per cent. of the essential element. The formula has been known in England as well as in France for many years. It was in the French Codex; and the only reference that has been made to it in the British Pharmacopœia was in the Addendum of 1865. Bland's formula is essentially the same as the iron pill of the British Pharmacopœia. It differs a little in the making; but if I asked for a Bland's pill and got one made from the British Pharmacopœia formula I should be satisfied.

By Mr. Bonsey: And if anybody told me the pill was not according to the British Pharmacopœia, but was Bland's, I should expect 20 per cent. of ferrous carbonate.

Mr. Bonsey said his defence was that his clients were retail chemists and druggists, who bought their goods, as they bought these pills, from wholesale manufacturers. They knew that if they were asked for an article which was in the British Pharmacopœia they must supply it. His clients had done what they had a perfect right to do—viz., declare that the pills were not according to the British Pharmacopœia, but were from Dr. Bland's formula, of which there were many—in fact, a pill for which there was no standard at all.

Mr. Mead: Do your clients say the pill is according to Dr. Bland's formula?

Mr. Bonsey: My clients buy from wholesale chemists, and the onus is upon the prosecution to show that we have done wrong.

Mr. Mead: You will have to show that this pill is according to Dr. Bland's formula. There is a *prima facie* case that there is a Bland's formula, and if you say there is none it is a misrepresentation to say there is. If this is said to be a Bland's pill it is of a different quality article from that demanded, and is to the prejudice of the purchaser. I want you to keep that fact in your mind.

Mr. Bonsey submitted that the prosecution had to prove that this was not the article demanded, and to prove this they must show what Dr. Bland's original formula was. He was entitled to say, "I am a retailer, and all things sold to me by a wholesale house are supposed to be good." Dr. Bland, some seventy years ago, invented an iron pill, but it has been altered and improved upon, and the name is now only a general designation for an iron pill. If a chemist gave more iron than is laid down by Bland that would be said to be to the prejudice of the purchaser; and if you gave less, and said so on the bottle, you would be wrong. Mr. Bonsey also contended that it was a proprietary medicine, and as such protected.

Mr. Mead, in giving his decision, said he was of opinion, in the first place, that when the inspector asked to be supplied with iron pills he was entitled to be supplied with iron pills of the nature, substance, and quality as laid down by the British Pharmacopœia. The fact that the man said "Bland's pills" did not take it out of that character. The ejaculation he used was in a synonymous and explanatory sense; and nothing was said which was intended to convey to the mind of the purchaser that he was taking something which was out of the description of the British Pharmacopœia. Therefore, he was entitled to receive iron pills according to the British Pharmacopœia. Then it was contended that the case failed under Section 8. The mere fact that there were labels on the bottle, "These pills are not prepared according to the British Pharmacopœia," and "Dr. Bland's

Formula," did not cover the defendants, because these notices were hidden by the outer casing. There was no evidence that any specific matter or ingredient had been mixed with the substance that was asked for, so that the label could be applied to such substance. The next question is, though protection under Section 8 was not given, had there not been sufficient notice to the purchaser under Section 6? The bottle was wrapped in paper, and if the inspector had been an ordinary purchaser, and had gone home with his purchase without opening it, he would not have known that he had not got what he expected to be served with. If he was not entitled to have pills according to the British Pharmacopœia, he was entitled to have something which was called Bland's pills. That that was so they had on the evidence. Both verbally and on the bottle he was led to believe he had Bland's pills. There was consequently *prima facie* evidence that Bland's formula did exist, notwithstanding the contention that it was a mere name, with no particular basis. The scientific witnesses said that such a thing did exist, and was recognised in the edition of the British Pharmacopœia of 1885. It was shown that it did exist, and that it was recognised, by the name being on the label of the bottle the defendants sold. It had been shown that a certain formula required certain drugs to be mixed so as to create 20 per cent. of ferrous carbonate—ingredients of manufacture by the chemical action of which the desired result was obtained. It was perfectly clear that the article supplied to the inspector in this case did not comply with such formula. Substantially there should be 20 per cent. of ferrous carbonate, but the evidence here showed that there was only 4.3 per cent., and, at the most, allowing for deterioration, there could not have been more than 8.4 per cent. So that there was a tremendous deficiency in the essential element. Mr. Bonsey had asked several questions with regard to the various formulas for the manufacture of Bland's pills in different countries—Germany, Austria, France, and America; but in his (the Magistrate's) opinion they had nothing to do with any foreign nation in this case except France. And they had something to do with France, because that was the country from which the original formula came. There were variations of detail in making up, and, possibly, in ingredients; but all the formulas came out practically with 20 per cent. of ferrous carbonate. There was another point Mr. Bonsey said there was no properly recognised Bland's formula at all. That was his defence. And, if that were so, there was a misrepresentation at once, because of the label on the bottle, which said, "Prepared from Dr. Bland's formula." The pills, in fact, were prepared from something which did not exist. On that ground alone the prosecution was entitled to succeed. Then it was urged that this was a proprietary medicine. But it was a very strong thing to say that, whether the man was alive or dead, it was a proprietary medicine. All other things failing, the defence had taken refuge in saying someone must come forward and say, "I have a proprietary right in this medicine," before this prosecution can succeed. He (the Magistrate) could not accept this defence, and the prosecution, under all circumstances, must succeed. He found that on both summonses the offence had been committed.

Mr. Bramall: There are four convictions against these people for selling drugs other than they should be.

Mr. Mead: What is the relative cost between 8.4 and 20 per cent. of ferrous carbonate?

Dr. Teed said he could not tell.

Mr. Bramall: The principal thing is the great loss to the people, who believe, when taking these pills, that they are taking the desired quantity of iron into their systems.

Mr. Bonsey: We have written to the wholesale houses for guarantees, and they have answered, "We beg to say that the pills supplied to you are prepared on Bland's formula; and we supply the same to all parts of the world."

Mr. Bramall said that a gentleman from one of the wholesale firms so strongly protested against the sale of these Bland's pills that he severed his connection with the company, and wrote Parke's people, amongst others, as to the risk they ran in selling them.

Mr. Bonsey: That is Mr. Lorimer.

Mr. Bramall: And I have given you notice to produce letters, in which he says, "These pills will get you into trouble if you continue to sell them."

Mr. Mead (to Mr. Bonsey): Is that correct that you have been put upon your guard?

Mr. Bonsey: This Mr. Lorimer is a wholesale chemist, who is interested in damaging us.

Mr. Mead: I will assume that. But you have had notice that these pills supplied by this firm were bad, and that unless you gave up selling them you would get into trouble. If you could show that you took analyses of them to assure yourself that they were good, there would be some excuse.

Mr. Bonsey: We declared that the pills were not according to the British Pharmacopœia, and believed them to be from Dr. Bland's formula. Here is a letter of July 12 which says these pills are made according to Dr. Bland's formula.

Mr. Mead: And you take no action to find out if they are good pills?

Mr. Bonsey: We got the reply that the company were quite prepared to say that the pills were prepared according to Dr. Bland's formula. That we considered an indemnity.

Mr. Mead: You have not taken sufficient precautions to satisfy yourself that they were good, or you might find indemnity.

Mr. Bramall: I wanted to read letters to show what has happened in this case.

Mr. Mead: You need not trouble. What are the previous convictions?

Mr. Bramall: There are four: 20s. and 12s. 6d. costs; 20s. and 5s. costs; 20s. and 12s. 6d. costs; and 20s. and 10s. costs.

Mr. Mead: And now it will be 50s., and 10s. costs.

Mr. Bonsey thought it was rather a strong proceeding for a local authority practically to take up a prosecution for a private firm; but

Mr. Mead replied that, in the interests of justice, they were entitled to use any means to prove their case.

Mr. Bonsey asked if the Magistrate could state a case for a higher Court?

Mr. Mead: You may consider your position, and apply again.

County Court Cases.

RECOVERING A PENALTY.

THE Pharmaceutical Society brought an action at the Leicester County Court on August 11, against Alfred Hodgson, 57 Biddulph Street, Leicester, for 5s., the amount of penalty incurred by him on May 1, 1903, by having sold laudanum, contained in a liniment, contrary to the provisions of the Pharmacy Act, 1838. The claim was admitted. Defendant said he had taken over the business from his father, who was a qualified chemist. Mr. Hincks (for the Society): The defendant is not a qualified chemist, and the Society must stop him from selling poisons. Judge Wightman Wood (to defendant): You have taken over a business which you are not qualified by law to take over. Defendant pointed out that he had now stopped selling these poisons entirely. The Judge told defendant it was a pity he did not admit the claim earlier. He would then have saved himself expense. Judgment would be given for the plaintiffs, with costs.

THE VINE-DRESSING.

AT Eastbourne County Court on August 6, Mr. William Hermon claimed 50s. damages from the Hull Chemical Company for the destruction of vines.

Mr. G. Thorn Drury, for the plaintiff, said Mr. Hermon carried on business at Pevensey as a grape-grower and florist; and defendants dealt in insecticides and various dressings for vines and other trees and plants. Towards the end of last year plaintiff saw one of defendants' advertisements in a horticultural journal, and wrote to defendants stating that his vine had become infected with mealy-bug, and seeking a remedy. Plaintiff subsequently received a letter in which he was advised to use an infusion of bitter aloes for the purpose of spraying the vine while the leaves were growing. The claim arose out of the effect of a new dressing which was to be applied early in the year for filling in the bark.

Judge Martineau: The doctor did not see the patient. He prescribed without seeing the patient.

Mr. Drury: Yes; without seeing the patient.

Plaintiff gave evidence bearing out Mr. Drury's statement,

and alleging that the preparation caused injury to the vines; and evidence was also given by Mr. Frederick James Dann (proprietor of the Floral Retreat, Westham), who said he had eighteen years' experience as a grape-grower. Plaintiff called witness in to see his vines after the dressing, and he (witness) came to the conclusion that they had been treated with something injurious. He was shown a tin which had contained the dressing. The smell was very peculiar and something like petroleum, which is a very dangerous thing to apply to a vine.

Further evidence having been given for the plaintiff, Mr. C. Robinson, F.I.C., F.C.S., deposed that he was consulting chemist to the defendant company. He remembered the circumstances of the case, and it was he who prescribed the treatment after consulting another gentleman who possesses an intimate knowledge of grape-growing. The preparation supplied was not injurious. It has been sold to others, and has been highly spoken of.

In cross-examination he objected to state what the dressing was composed of, but the solicitor for the defence offered to give the Judge the details, as the recipe is a trade secret. Evidence as to the usefulness of the dressing in vine-culture having been given, it was suggested for the defendants that the remedy was applied too late. The advice given was that the dressing should be used in the latter part of January, or early in February. It was not applied till February 24. No one could guarantee that a diseased condition could be cured. A doctor was entitled to his fees if a patient died or remained uncured.

Judgment was given in favour of plaintiff, and the damages assessed at 40*l*.

Bankruptcies and Failures.

Re WILLIAM CHARLES CUNNINGHAM PARK, lately trading in partnership with J. J. Macfadyen and James Park as Park, Macfadyen & Co., West India Merchants, 24 Lime Street, E.C.—At the London Bankruptcy Court on August 7, before Mr. Registrar Brougham, an application for an order of discharge was made by this debtor. The firm failed in May, 1902, with gross liabilities 259,160*l*., of which 205,000*l*. was expected to rank, and assets estimated to produce 133,987*l*. The trustee now reported that the proofs actually admitted (185,107*l*.), and the probable claims not yet admitted (10,000*l*.), amounted to 195,107*l*. The assets have so far realised 74,526*l*., and would probably produce a further 26,000*l*. The difference between the actual value of the assets and the debtors' estimate is accounted for mainly by the failure of debtors to the estate and attachments by American creditors of debts due in the Danish island of Sainte Croix. A first dividend of 5*s*. in the pound has been paid, and a further dividend of about 5*s*. in the pound is probable. His Honour, after hearing Mr. Carrington in support of the application, said that, having regard to the assistance rendered by Mr. Park to the trustee and the straightforward manner in which he had given his evidence, his discharge would be granted.

Re E. LEAK & Co., 35 Bedford Road, Clapham, Manufacturing Chemists.—A sitting of the London Bankruptcy Court was held on August 11, before Mr. Registrar Linklater, for the public examination of Thomas Wilkie and Joseph Leek, trading in partnership as above, and formerly at the Falcon Grove, Battersea. The joint statement of the firm's affairs shows liabilities 460*l*. 15*s*. 2*d*., against assets 164*l*. 15*s*. 3*d*., whilst the separate estate accounts show that Leek has a deficiency of 242*l*. 4*s*. 9*d*., and Wilkie a deficiency of 357*l*. 2*s*. Leek stated, in reply to the Official Receiver, that he was a chemist and druggist, and he commenced business as a manufacturing chemist at Falcon Grove in March, 1902. He traded there in partnership with another person as E. Leek & Co. until October, 1902, when the partner retired with 75*l*., and witness continued the business alone until January, 1903. He was then joined by Mr. Wilkie, who contributed 450*l*. as capital, and lent the firm 45*l*. to meet the bank overdraft. The business was removed to Bedford Road in March, and on May 19 the Sheriff there entered into possession. Two days later the premises caught fire, owing to a leakage of the gum used in the fly-paper machine coming into contact with the gas. The stock was insured at Falcon Grove, but the company would not transfer the insurance to Bedford Road, and the fire occurred before negotiations with another company could be completed. The failure was caused by the fire in question. Wilkie was also examined by the Official Receiver, and both debtors were allowed to pass.

Re CHARLES PAGE DYE, The Central Pharmacy, Marlow, Buckingham, Chemist.—On August 10, at Aylesbury, this case

came on for hearing. In reply to Mr. Cecil Mercer (Senior Official Receiver) debtor stated that his liabilities expected to rank for dividend amounted to 4,512*l*. 8*s*. 2*d*., and he estimated that his assets would produce 1,329*l*. 1*s*. 10*d*. He started in business at Marlow eleven years ago, having previously been in business at Peterborough. His free capital on starting was 600*l*., and he had borrowed sums amounting to over 3,000*l*. from relatives and friends, which had been expended on carrying on and improving his business. The bulk of this money he never expected he should be called upon to pay, as it was secured by his wife's reversionary interest in her father's will. He had recently given two deeds of assignment, both of which had proved abortive by a creditor's petition being filed. Debtor further explained that the freehold premises in which he had been trading had been sold by auction at a ridiculously low figure, and a question had cropped up as to the ownership of the fixed machinery, which was still in abeyance. He had a branch chemist's business at Bourne End, in which he had placed a manager. Marlow being a summer-resort the business depended very largely on the influx of visitors during the river-season, and the past season had proved a failure in this respect. He attributed his bankruptcy to "want of capital, bad trade, and family illness." He did not know until a few weeks ago that he was in such an insolvent position. It was true there had been several County Court judgments given against him and also an execution levied. The whole of the furniture belonged to his wife and was now claimed by her. Having given particulars as to the books kept, debtor stated that his book-debts amounted to 246*l*., this large amount being due to the fact that some customers paid one season under the other. The only expectation he had of being able to meet his liabilities was by a good summer-season. Mr. Oscar Berry, of Monmouth House, Monument Square, London, E.C., chartered accountant, has been appointed trustee.

Deed of Arrangement.

Faulkner, William, 815 Romford Road, Manor Park, chemist and druggist. The following are creditors:

	£	s.	d.
Baiss Brothers & Stevenson (Limited), London	...	77	0 0
Gibson, R., & Sons (Limited), London	...	15	0 0
Haile, A., London	...	16	0 0
Horsely, E. P., Waltham Cross	...	44	0 0
Idris (Limited)	...	36	0 0
Lynch & Co. (Limited), London	...	15	0 0
May, Roberts & Co., London	...	22	0 0
Sanger, J., & Sons, London	...	55	0 0
Urban District Council	...	11	0 0
Wilkinson, J. F., Pendleton	...	16	0 0
Wyleys (Limited), Coventry	...	10	0 0
Bankers' claims...	...	32	0 0

Gazette.

Partnership Dissolved.

Chadwick, M. H., and Kitching, H., under the style of the Farolene Manufacturing Company, Manchester, disinfectant manufacturers.

The Bankruptcy Acts, 1883 and 1890.

ADJUDICATIONS.

Bull, Charles (carrying on business under the style or firm of the Brynmawr Mineral-water Company), Brynmawr, Breconshire, coal-miner and aerated-water manufacturer.

Chandley, George, Rugby, builder and mineral-water manufacturer.

Coxon, Annie Elizabeth (trading as Robinson & Co.), Chester-le-Street, grocer and druggist.

Dye, Charles Page, Marlow, Buckinghamshire, chemist.

Edgar, Henry, Walnut Tree House, High Road, Leytonstone, N.E., and High Road, Leytonstone, N.E., late Red Leaf, Cambridge Park, Wanstead, N.E., and Leybourne Road, Leytonstone, N.E., veterinary surgeon.

Knight, George Thomas, Newbridge, Monmouthshire, late Caerphilly, Glamorganshire, chemist.

ORDER MADE ON APPLICATION FOR DISCHARGE.

Wallis, Thomas (formerly carrying on business as Wallis & Co.), Wrexham, mineral-water manufacturer. Discharge suspended for two years, ending July 15, 1905.

Observations and Reflections.

By XRAYSER.

Chemists' Advertisements

do not seem to commend themselves to "Adeps Adeptis" (page 184), nor will they to Dr. Burnet if they deal with the liver as physiologically as Mr. Sweedle or Mr. Reader did. But "Adeps" is a little too flattering. The ordinary chemist does not talk about the liver as neatly as Mr. Reader did, unless he has studied up the subject, and has already written his label. His label then becomes his brief. Accurate writing comes first: good talking follows. I quite agree with "Adeps" that advertisements should be concise, and the price of space generally enforces this teaching; but I can hardly agree with him that they should reproduce the talking style. Nothing is much more repulsive than the familiar style now sometimes affected, which is supposed to be American.

"Defend me from the Toil

of dropping buckets into empty wells, And growing old in drawing nothing up." So wrote Cowper, and the familiar lines would intrude on the mind which was trying to contemplate calmly the pharmaceutical labours and discussions which have been brought to a head within the past fortnight. This comment applies only to the sheaf of political proposals which have come before us. The value of scientific investigations can never be prognosticated, so that the Conference papers proper do not come into consideration just now. But if only out of respect to those who think for us, it is right that we should pay due attention to their ideas. Here is

A Table of the Schemes

which our sages have lately devised or suggested for our discussion, and for the promotion of our wealth, health, or happiness:

Author	Scheme	Object
Mr. Idris	A Statute	Separation of Pre- scribing and Dis- pensing
Mr. Atkinson Mr. Tocher	Guild of Pharmacy Division of Great Britain	To check Stores Territorial Represen- tation on Pharma- ceutical Council
Mr. Carteighe	Compendium of For- mulæ	(Partly) To meet In- land Revenue Dif- ficulties
Mr. Glyn-Jones	Post-graduate Lec- tures	To help us with Side- lines
Mr. Cross	Board of Reference under Sale of Food and Drugs Act	To secure Uniformity of Administration

These are merely the new schemes, or old ones cleaned up, submitted within the past few weeks. There are plenty of others besides—moss-covered old buckets which have been dipping into empty wells for a long time past. Let them go on; but the fact that we are spending our strength for naught over the old objects is not itself a sufficient reason for taking over a batch of unremunerative new ones. What of

Territorial Representation,

for example? It does not appear that anyone desperately desires this. Mr. Tocher seems to have been attracted to the subject by the mathematical problems which it presented, but he does not press its advantages. If the Pharmaceutical Society were now being

organised, the method of representation on its Council might be beneficially discussed. Should each member of the Society have the opportunity of voting for all the Council, or for his one district representative only? Obvious reasons can be advanced for the adoption of either plan, but unless it can be conclusively shown that the circumstances and requirements of pharmacists in various parts of the country are so distinct and distinguishable that a specially instructed person is necessary to properly defend the interests of those resident in each of the localities, the proposed alteration can hardly be justified.

The Dispensing-bucket

will have to be dipped many hundreds of times into the well before it brings up enough refreshment to satisfy the thirst of even one chemist per town. But that well is not entirely empty. There is a real danger in medicines dispensed by the person who gives the death-certificate to which public attention should be called from time to time. One of Mr. Idris's arguments in favour of the legal separation of prescribing and dispensing is that this is enacted "in almost every other civilised country in the world." There are a good many European countries where the law is as stated, but I believe there is no such enactment in North America, Asia, Africa (except, perhaps, Algeria), or Australia. Still, the argument remains; I suppose it may be said that the continents named are either ruled by British, or by more or less uncivilised, races. But I am wondering how the President of the B.P.C. would meet his own contention in another field of activity where he is prominent. He is, I expect, a "convinced free-trader"; the rest of the world is much more unanimous against his views on that than on the dispensing subject. Is that conclusive?

Mr. Carteighe's Compendium

may serve some useful purpose, but neither that nor a dozen new Formularies will save our three-halfpences. High-class pharmacists are congratulating themselves on the prospect of being able to recommend sal volatile and Gregory's powder, on the possible abolition of the penny pill-trade, and on what they are pleased to call the discouragement of quackery. But the fact remains that hitherto we have been permitted to "hold out" certain preparations without stamping them or disclosing the formula, and that the loss of that privilege will cost a little each to a good many thousands of chemists. What the Compendium is to be is not clearly stated. Apparently it is to be "a mere compilation," for that is what is to distinguish it from the B.P.C. Formulary. Will it give formulas for imitations of the popular proprietary medicines? That, I suppose, is an irreverent question; but it will be a rather difficult task to avoid doing this unless its scope is to be strictly limited to medicines not often required.

The Other Schemes

proposed owe their attractions, if they have any, to the imposing titles given them. A Guild of Pharmacy could be nothing more in these days than one more Association; courses of post-graduate lectures can only resolve themselves into an occasional demonstration by someone who has paid particular attention to a special sideline; and a Court of Reference under the Sale of Food and Drugs Act means either a hard-and-fast authority, controlled by the analysts, which should largely supersede our present safeguards of magistrates and Somerset House, or it means a few paid officials to do nothing. Are we not devoting the vacation weeks a little too vigorously to ploughing the sands?

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Editorial Comments.

Regarding Education.

It is fashionable just now to be pessimistic about the educational advantages offered by this country, but a perusal of a hundred or so of prospectuses and syllabuses of universities and schools of pharmacy in the preparation of the educational digest given in this issue convinces us that as regards pharmacy that attitude is incorrect. Beginning at what may be regarded as the lowest rung of the ladder—the excellent South Kensington science classes—there is not a chemist's apprentice who can complain that these are inaccessible or beyond his means. Towns of fair size, and even large villages, can provide instruction in at least chemistry, whilst the scope of the classes is much widened in the case of large towns and cities. The technical institutes of the United Kingdom are probably unsurpassed in the world, and it is not the fault of these establishments that the classes are not always taken full advantage of.

The demands made upon pharmacists require that the educational thoroughness shall be at least equal to that demanded in any of the professions, and it may not be out of place to repeat Past-President Newsholme's aphorism that masters "will require in the future to allow their apprentices more time for education." The pharmacists of the future must be encouraged to lay a good foundation in their youth for the education which is to make them fitted for the keen struggle which is before them. Public and private enterprise together have provided this country with a system of schools of pharmacy which could not have been approached for excellence if the matter had been left to officialdom. Many apprentices would, if time were allowed them, take out such a concurrent curriculum as that recently outlined by Mr. Gadd before the British Pharmaceutical Conference.

Mr. Tocher's project for a university degree in pharmacy is not yet *un fait accompli*, but there is reason to believe that the scheme will be realised before long. It has behind it the man who can enthuse it into being if anyone can. The English universities are in a ferment of progress. The re-constituted London University bids fair to outstrip the older schools of learning, and the dismemberment of the Victoria University is but a sign of forward movement. Birmingham is finding her university scheme working smoothly, Liverpool has just received her charter, and the charters of the Victoria University of Manchester and the Yorkshire University of Leeds have passed the Great Seal, and cannot be delayed much longer. We have even the suggestion that the Univer-

sity of Liverpool shall be free—an experiment which so far has not been tried in this country.

Turning again to the pharmaceutical examinations, is there not room for some improvements in the manner these are conducted? We suggest that a committee of the Pharmaceutical Society should investigate the cause of the deplorably large percentage of failures which takes place every time in the Minor examination. We do not believe in the cry that the lack of a curriculum accounts for the failures, even when that opinion is backed up—or should it not rather be—is followed!—by the Government Visitor. The examination is now of such a severe character that division cannot in fairness to the candidates be delayed much longer. “We have no power to divide the Minor,” plead the Society; yet the cry is answered in a way by an offer to halve the Major! One is forced to the conclusion that the Society are retarding rather than promoting education, and the promotion of education is always being brought forward as one of the three corner-stones of the charter. There is plenty of life in pharmacy yet, but the Society should be careful not to throw grit into the bearings of the machine entrusted by the State to their care.

A word of explanation ought to be given for the earlier appearance of the Educational Number this year. It is due to the fact that the tendency of the schools of pharmacy is to begin the session earlier in September than formerly. Students will now have more time to study the respective claims of the various institutions than was the case when the information was given simultaneously with the opening of the session.

Government Chemistry.

THERE are one or two points in the Government Laboratory report which are of much interest to chemists. The work of the Laboratory is mainly in connection with the Revenue Departments in the examination of goods liable to Customs duty. For instance, methyl alcohol, not in itself liable to duty, has to be examined to see that it has not been so purified as to be potable. Soap may contain sugar, and acetic and butyric ethers may be used as flavouring ingredients in confectionery. Drugs, patent medicines, and toilet-preparations, to the number of 1,877, were examined to see if they contained dutiable articles, and the duties of the Laboratory even extended to examining the liquids of thermometers and storm-glasses to ascertain the proportion of spirit present. The importation of cocoa-butter has considerably fallen off since the imposition of the duty of 1*d.* per lb., being now largely made from the raw cocoa by British manufacturers of cocoa and chocolate. Imported surgical preparations and soaps sometimes contain cocoa-butter, and have to pay duty accordingly. Extract of tobacco cannot be imported into this country, but nicotine, used as a sheep-wash and insecticide, is not prohibited if it contains not less than 90 per cent. of pure nicotine calculated on the anhydrous solids. Reference is made to the smuggling of saccharin, that substance having been found surreptitiously admixed with the most unlikely materials with the view of evading duty. It shows the thoroughness of the steps taken to collect the customs when we read that 138 samples of imported textile fabrics were examined at the Laboratory to see to what extent dutiable ingredients were used for sizing and finishing. The quantity of starch and dextrine was, however, found to be trivial.

In the Excise division of the work of the Laboratory much beer was examined, and in forty-four samples arsenic in notable quantities was present. The largest quantity of arsenious oxide found was, in malt, $\frac{1}{30}$ gr. per lb.; in glucose, $\frac{1}{40}$ gr. per lb.; in wort, $\frac{1}{30}$ gr. per gal.; and in water-soften-

ing material $\frac{7}{10}$ gr. per gal. In connection with one of the samples of wort containing $\frac{1}{30}$ gr. of arsenious oxide per gal., a sample of a substitute for hops sold as “Hop Compo” was forwarded for examination, and found to contain not only $\frac{1}{4}$ gr. of arsenious oxide per lb., but also 35 gr. of oxide of antimony per lb. The Commissioners of Inland Revenue at once directed an inquiry to be made into the origin of the “Hop Compo,” and an inspector, in conjunction with the local medical officer of health, elicited that it consisted of hops, chiretta, and tannic acid, and had been made by a druggist in the Midlands. This druggist does a large business in veterinary medicines, one of which is a horse-powder containing a considerable proportion of oxide of antimony, and it transpired that some of the vessels used in making the horse-powder had also been used in making “Hop Compo.” Although it was alleged that the vessels had been cleaned between the two operations, there can be little doubt that in this way the “Hop Compo” had become contaminated with oxide of antimony containing traces of arsenic. No “Hop Compo” was found in stock, and there is no reason to doubt the statements that its sale was very small, and that only 2 lbs. had been made at the time of the sale to the brewer in question.

The exportation of medicinal tinctures, flavouring-essences, and perfumes on drawback continues to grow. In the past year 12,878 samples, representing 118,557 gals. of spirit at proof, have been examined, as compared with 11,001 samples and 109,396 proof gals. in the previous year. Samples of wood-naphtha for methylating-purposes, representing 331,509 gals., were examined as to their suitability, and samples representing 14,231 gals. were rejected. An interesting note is appended to a report of the work done for the Board of Agriculture—viz. that boric acid was present in 98 per cent. of the samples of butter from Australia and Belgium, 83 per cent. of the French samples, 78 per cent. of those from New Zealand, 77 per cent. of the South American samples, 45 per cent. of those from Holland, and 43 per cent. of the samples from the United States, but only 16 per cent. of the Canadian samples contained this preservative. There is also a note that an investigation was made for the Record Office with reference to the revival of faded ink and as to the reagents that could safely be used as ink-revivers, but unfortunately the result is not given. For the Stationery Office the facts were confirmed that typewriting-ribbons containing ink with a carbon basis yield permanent copies, and that inks containing artificial-dye compounds can be readily discharged by chemical reagents and light. Iron pills deficient in iron, cream of tartar deficient in bitartrate of potash, and saltpetre said to contain common salt, were referred by magistrates to the Laboratory, and in each case the results agreed with those obtained by the public analyst.

Technical Education in Germany.

DURING the past few years the cry for technical education has become more and more insistent. Britain is said to be falling behind in the race for commercial superiority mainly on account of her neglect in educating her artisans on scientific lines. The example of Germany is cited *ad nauseam*, and we are asked to imitate that country in the building of those large colleges and schools which appear to be principally devoted to science and in a lesser degree to handicrafts. Eminent scientists and statesmen utter public warnings regarding the non-technical condition of this country, and things have gone so far that Lord Rosebery (*C. & D.*, July 4, page 20) has propounded a scheme for the establishment in London of a technical college on the principle of Charlottenburg. Whether a higher scientific education

will tend to the production of better handicraftsmen or otherwise is a question which the future will solve, but it is sufficient for us at the present time to remember that Germany, which is always being extolled for her greater scientific attainments, has still to make up considerable leeway before she can be placed on a level with Great Britain either in the quality or quantity of her exports. However, it behoves us to keep our eyes open to all that is going on in the world; and we note a summary of the technical-school system in Germany which has been compiled by Mr. Ernest L. Harris, commercial agent for the United States, at Eibenstock. Mr. Harris says "there are 287 industrial schools in Saxony." By "industrial" we assume that he means technical; and as the population of the Kingdom of Saxony is 4,202,216 it is evident that there is one technical school to every 14,641 inhabitants. The schools are divided into five classes: advanced industrial schools, special industrial schools, industrial schools for drawing and painting, industrial schools for women, girls, and children, and industrial primary or continuation schools. There are twelve advanced industrial schools in Saxony, and the curriculum of the advanced school in Chemnitz is a fair sample of the others. The curriculum is divided into five minor schools known as the industrial academy, architecture, machine construction, dyeing, and industrial drawing departments. The Industrial Academy gives four courses—for mechanics, chemists, architects, and electricians. The conditions of admission demand of the student sufficient education to be in possession of a certificate which entitles him to one year's service in the Army. In addition to this, he must show evidence that he has been two years in some factory acquiring practical knowledge in the branch in which he desires to perfect himself theoretically in the technical school. The course of study for mechanics, for instance, is as follows: German language and literature, architectural drawing, mathematics, surveying, chemistry, mechanics, machine drawing and sketching, freehand drawing, political economy, geometry, physics, metallurgy, machine architecture, and machine construction. These are all compulsory, but the student may elect to have, besides, French, bookkeeping, weaving, English, beer-brewing, sanitary arrangements, arithmetic, or spinning. There are about one hundred and fifty special industrial schools in Germany for training young men to become expert workmen in various trades and industries, and amongst them are three schools for "druggists." The curriculum of the tin and metal industrial school in Aue is characteristic of what all these schools teach. The subjects are arithmetic, drawing, physics, bookkeeping, geometry, sketching, mechanics, correspondence, German, modelling, and chemistry. The students devote twenty-eight hours weekly to practical work in the tin and metal workshops of the school and the factories in the city. There are forty-four industrial primary or continuation schools in Saxony. These give boys and girls who have completed the public-school course the chance of preparing themselves in a general way for some trade or other particular branch of industry without the express intention of following the same. In 1882 there were only twenty-two industrial schools in Saxony, while to-day there are 287. The increase of the number of technical schools in Saxony is characteristic of the whole of the German Empire. The inception of the technical school in Germany was apparently in 1862, when the city of Barmen sent a Commission to Switzerland to study the technical schools of that country. The result was the establishment of an industrial school in Barmen with elementary and advanced departments. A pupil who desires to be admitted to the elementary schools must be twelve years of age and able to read German fluently, and be capable

of doing ordinary sums and arithmetic. During the winter months practical work is carried on in laboratories and workshops. The Crefeld Industrial School for Textiles is one of the best in Germany. Young men are prepared by practical and theoretical instruction to become managers and manufacturers, as well as thorough experts in the textiles produced in Crefeld. The course lasts two years. The city supplied the site, and gave 7,000*l.* towards erecting the school-building. In Spremburg, Guben, and Kottbus weaving-schools were established many years ago. Similarly, all over the country there are technical schools for the various industries of the particular city and district. In Wurtemberg and other places there are schools for making jewellery, medical instruments, &c., and in Rottenburg there is a school for wood-carvers, in Geislingen a school for engravers, in Rottweil one for ivory-carving, and others at various places for gold- and silver-plated ware. Technical education in Baden is far advanced, and Hessen can boast of the fact that there is not a single village in the whole country which has not a technical school of some kind, with workshops for actual practice. It will thus be seen that the example of Saxony has spread all over the German Empire, and that if technical education is to be of value to the commerce of the future, Germany, judging by the number of her educational institutions, will at least have a fair show.

Doctors Dispensing.

The *British Medical Journal* does not think the arguments put forward by Mr. Idris in his presidential address before the British Pharmaceutical Conference at Bristol last week were convincing. What most interests us in our contemporary's remarks are the views expressed on dispensing:

The operation of dispensing is a far simpler one than it suited Mr. Idris to represent it to be. . . . Given a prescription which is capable of being read, nothing is easier than to measure out the desired quantities, and mistakes of a character likely to lead the dispensers into the presence of coroners' juries can occur only through the grossest carelessness, such as no amount of instruction or tuition would prevent. If ordinary dispensing were in any way a difficult matter, the "Minor qualification" as dispenser, in virtue of which dozens of young men and women receive the testimonial of the Apothecaries' Hall every year, would not be allowed to exist; for the practical experience in dispensing demanded is of the most elementary kind. What does demand tuition and experience is true pharmacy, or the preparation of drugs and knowledge of their chemical and physical affinities, and on the neglect of this useful study, some knowledge of which is essential to the correct prescription of remedies, the medical press has commented of late years.

It astounds us that a writer in a medical journal can know so little of the "Minor qualification" as to muddle up that examination with the Apothecaries' Assistant examination. If, on the other hand, the views expressed on dispensing are at all representative of those of the medical profession, it adds another argument to those put forward by Mr. Idris for prohibiting the dispensing of medicine by medical men.

An Anti-dummy Crusade.

*See yonder pale Brodrick, gaunt as a mummy:
There isn't a doubt he was reared on a dummy.*

Butler's Analogy (revised).

THE deterioration of the national physique has recently been agitating the minds of some correspondents of the *London Standard*, and many causes have been attributed for this alleged degeneration. In a recent issue, however, Mr G. W. Butler has drawn attention to a practice with which all pharmacists are familiar, and which he thinks a most important factor in this degeneration. Our stalwart fathers and mothers have been succeeded, he says, by the puny race of the present day largely owing to the "dummy-teat." From the first week of a child's life until it is about two years old, writes Mr. Butler, it is seldom to be seen without the

"dummy" in its mouth. It is popular with nurses and mothers because it keeps the child quiet; but so long as this deadly "baby-soother" is in use, the salivary glands are in action, and the strength of the child's constitution is being sapped away. He cites an example to prove his theory. A mother died at the birth of twins. The infants were taken by two different neighbours to nurse. One has grown up of normal stature; the other is rickety and undergrown. The rickety one was allowed a soother; the healthy one was not. On these premises Mr. Butler hopes the medical profession will wake up to the magnitude of the evil, and that the sale of the soother will soon be sternly forbidden.

Blaud's Pills.

Even the forensic ability of Mr. Bonsey has failed to convince the North London Magistrate that Blaud's pills should not agree—at least in ferrous carbonate—with the pilula ferri of the British Pharmacopœia. Mr. Mead ruthlessly analysed each of the arguments put forward for the defence, and imposed a prohibitory fine. Had Mr. Bonsey been able to prove, as he contended, that Blaud's pills are a proprietary article, there might, as the Magistrate said, "have been something in it." But Mr. Bramall, who has had a close study of the Sale of Food and Drugs Acts forced upon him by some severe lessons in the past, was too well prepared. He reads THE CHEMIST AND DRUGGIST to some purpose. When in our issue of April 25 (page 693) we gave a correspondent the history of the formula, we scarcely expected that it would be the basis for a legal defence. And when in the following week Mr. Ince's letter with Monsieur Blaud's enclosure appeared, the apparently contradictory nature of Monsieur Blaud's communication was evidently noted by Mr. Bramall, and Mr. Ince was cited as a witness. Mr. Bonsey should have had Monsieur Blaud brought over, as Mr. Bramall threatened to do, and the matter would then have been settled once and for all. Meanwhile Mr. Mead is definite enough in his decision, and it behoves all careful pharmacists to see that their stocks of Blaud's pills conform to the B.P. in the strength of ferrous carbonate. From inquiries we have made this week we find that, although there are plenty of pills on the market which are not B.P. strength, they can invariably be distinguished by the price. Pills of full strength are readily obtainable.

The Sugar Convention.

A supplement to the *London Gazette* has been issued containing an Order in Council prohibiting the importation of sugar from Denmark, Russia, and the Argentine Republic—countries which grant bounties on the export of sugar. Regulations are added requiring certificates of origin of sugar imported from countries other than the three specified. A second Order in Council provides for the inspection of sugar-refineries in the United Kingdom. The evidence of origin required shall be in accordance with that laid down by the Permanent Commission in the articles agreed to by them for observance of the Convention, viz.:

All sugar (other than molasses and sugar-sweetened products) shall be accompanied by a certificate of origin indicating (a) the kind and quantity of sugar; (b) the kind, number, and marks of the packages; (c) the country of production, of origin, or of manufacture, and the country of destination of the goods; and (d) the mode of carriage by land or water.

The second Order enacts that, after September 1 next, "every sugar-factory and sugar refinery and factory for the extraction of sugar from molasses in the United Kingdom shall be under the supervision either of the Commissioners of Customs or of the Commissioners of Inland Revenue."

THE business of Mr. C. J. Rees, chemist, Watford, is closed, the proprietor having retired.

Trade Notes.

THE NEWLY REVISED PRICE-LIST of Messrs. May, Roberts & Co., Clerkenwell Road, E.C., just issued, seems to be thicker and bulkier than usual. It is being sent out to chemists this week.

A TABLOID PRODUCT.—Messrs. Burroughs, Wellcome & Co., Snow Hill Buildings, submit to us a specimen of sugar-coated tabloid iron phosphate and iron hypophosphite, which is being placed on the market. The combination is a useful tonic in anæmia, the iron phosphate being in the proportion of 2 gr. and the hypophosphite 1 gr. in each tabloid.

BLAUD'S PILLS.—Amongst the samples of these much-talked-about pills which have been submitted to us this week by wholesale firms we note a specimen of the oval gelatin-coated iron pills made by Messrs. Heaton, Squire & Francis (Limited), Southwark Street, S.E. The pills contain 20 per cent. of ferrous carbonate, and are prepared in such a way that deterioration will not set in within a reasonable time if ordinary care is exercised in storing.

ATTFIELD'S "CHEMISTRY."—This is an appropriate time to refer to the fact that the eighteenth edition of Attfield's "Chemistry" is in the press, and is to be ready by September 1. More copies of this book have been sold than of all the other books on pharmaceutical chemistry put together, and its popularity should continue, seeing that Dr. Leonard Dobbin has edited the new edition. We shall refer to the book again when we have had an opportunity of noting the alterations that have been made in it; but students may rest assured that the eighteenth edition will reach the high-water mark in the tide of pharmaceutical favour.

Business Changes.

LINDSAY'S DRUG-STORES have been opened at 158 Gorse Street, Edmonton, N.

MR. J. LEWIS, chemist, of Mile End Road, is opening a business at 1 Tredegar Road, Bow, E.

MR. J. PAINTER, chemist and druggist, late of Malmesbury, is now in business at Gorse Hill, Swindon.

MESSRS. T. JONES & CO., chemists, have acquired the premises 17 The Boulevard, Balham High Road, S.W.

MESSRS. J. L. DAVIES & SON, chemists, 7 High Town, Hay, have refitted their pharmacy in an up-to-date style.

MESSRS. CROYDON & CO., dispensing chemists, are removing from 45 Wigmore Street, W., to 55 in the same thoroughfare.

MR. J. T. CALLAWAY, chemist and druggist, is opening a pharmacy at 170 Richmond Road, Ilford, E., as soon as the necessary alterations are completed.

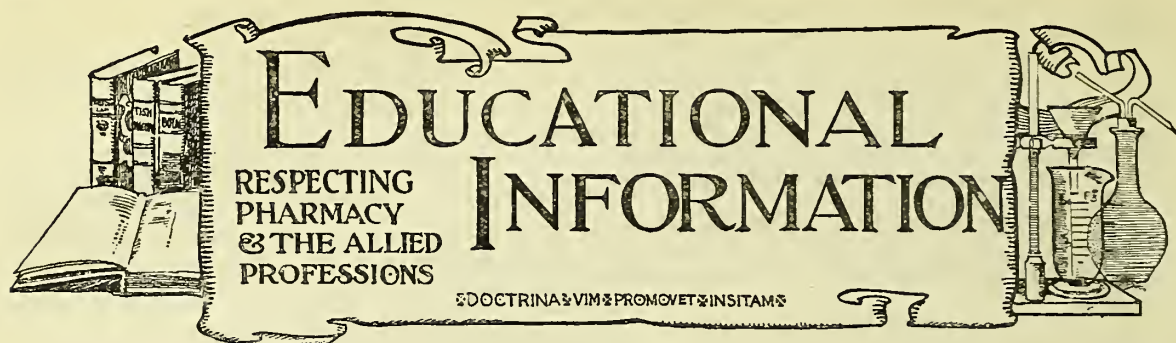
MR. HERBERT F. COOK, chemist and druggist, has disposed of his branch business, the Rock Pharmacy, Cherryinton Road, Cambridge, to Mr. W. T. Archer.

MESSRS. J. T. DAVENPORT (LIMITED), manufacturers of Collis Browne's chlorodyne, have moved from 33 Great Russell Street, W.C., to 117 Union Street, S.E.

MR. T. A. WHITE, pharmaceutical chemist, of 11 Elm Grove, Southsea, has removed his business to new premises at 37 Elm Grove, which are much more convenient for business-purposes.

IN accordance with the order of the London County Council for re-naming Trevor Terrace, Knightsbridge, S.W., the premises of Messrs. J. B. Barnes & Son, pharmaceutical chemists, will henceforth be known as 225 and 227 Knightsbridge, S.W.

THE shop of Mr. George Williams, chemist and druggist, at 131 Embden Street, Manchester, has been closed, although the stock and fixtures have not yet been removed, but the blinds are down, and on the windows and door are printed placards stating that the "business has been transferred to 171 Preston Street," where Mr. Williams has another pharmacy. The shop in Embden Street was established about 1870 by the late Mr. James Hart, pharmaceutical chemist, and Fellow of the Chemical Society, who carried it on for twenty-five years, when it passed into the hands of Mr. Williams.



Introductory.

THE golden way to success in all professions is a sound school-education. This is as true of pharmacy as of any other branch of medicine, and it is equally true of science. In regard to medicine a classical education used to be indispensable, and it still is; but, with the exception of several universities, Greek is not a compulsory subject for a medical qualification, and in any case only when the M.D. degree is sought. Mathematics figures in the Preliminary examinations for all the callings dealt with here, and for those who are proceeding to a scientific career that subject cannot be overdone during schooldays. We consider it important that any youth who is intended for any of the callings should, during the last two or three years he is at school, have his studies directed to the professional requirements. A boy who is to be an analytical chemist or electrical engineer should not remain on the classical side beyond the fourth form; the science or modern side of the school gives greater attention to the subjects of most service to him. Those who are to enter any branch of medicine may remain on the classical side, taking French or German along with Latin. It is desirable to devote the last year at school to preparation for an examination which will admit the student to the branch which he has selected. The London University Matriculation examination is the "open sesame" to all callings, for the examination comprises the subjects required by the General Medical Council and the Pharmaceutical Society; it entitles the matriculant to register as a student of pharmacy, medicine, or dentistry, and also suffices for veterinary surgery or science. The following contrast of the subjects will show the extent of the three examinations mentioned:

<i>Pharmaceutical.</i>	<i>Medical.</i>	<i>London Matric.</i>
English grammar and composition	English grammar and composition, history, and geography	English
Latin	Latin	Latin or a science subject
A modern language	A modern language or Greek	A modern language
Arithmetic	Arithmetic	Arithmetic
Algebra	Algebra	Algebra
Euclid	Geometry (Euclid, Books I.-III.)	Euclid
To be passed in not more than two examinations.	To be passed at one time in many cases.	To be passed at one time.

The "Pharmaceutical" column includes the subjects specified by the Pharmaceutical Society of Great Britain, those under the "Medical" are set forth by the General Medical Council. Neither of these bodies conducts an examination, but each recognises certificates of certain specified examining bodies (to be named hereafter). The medical examination qualifies for pharmacy, but the pharmaceutical examination does not qualify for medicine, except in a few cases. The London Matric. qualifies for both pharmacy and medicine, provided the student takes Latin and a modern language in his examination. The Pharmaceutical Society of Ireland conducts a Preliminary examination itself (see page 322), but it recognises all the examinations approved by the Society in Great Britain and

by the Medical Council. Under each section we give fuller particulars as to registration as student. Before proceeding to these and other official details, it is instructive to give the personal experience in various departments of men who have gone or are going through "the mill." In some cases the remarks are critical in nature, and are intended as much for the powers that be as for the student.

The Pharmaceutical Preliminary Examination

is the subject of the first paper, which is written by an Edinburgh teacher, and touches a difficulty that exists on both sides of the border:

I wish to draw the attention of the proper authorities to the severity of the Preliminary examination now required by them in order that apprentices and junior assistants may register as students of pharmacy.

Most young men either pass this examination during their apprenticeship or soon thereafter, and their time for study depends largely on their hours. Probably all they have is two hours per night, or an afternoon off per week; therefore it is difficult for them to prepare the work that is necessary to pass the Educational Institute's Medical Preliminary examination. This is seen by the numbers who now register annually. What I suggest is that a simpler examination should be instituted under the care of a joint committee or board, and held twice a year—in April and September. It should be slightly more difficult than the old Preliminary the Society had. For this examination, I suggest that the subjects might be English, arithmetic, Latin, and bookkeeping, on the lines of the First examination for the Scottish Law Agents in General Knowledge, and also that of the Chartered Accountants. These subjects are more or less useful to the students themselves. For this a fee of, say, 1*l.* 1*s.* 6*d.* or 2*l.* 2*s.* could be charged to cover the expenses of management and examiners' fees, &c., over and above the subsidy due to the Society to be registered as a student for the Minor.

Possibly the examination could be passed at two sittings, but this is a small detail for future consideration. The joint Board would consist of one member from each Branch, whose principal duty after the scheme is put into working order would be to sign certificates, the work at each centre being done by a local secretary. The Board would hold office so many years, and might become permanent, as in the case of the Scottish Law Agents. They would appoint examiners, who would only hold office three years.

The advantage to apprentices, &c., would be great, as I am sure the cost to them would be less. At present the cost is approximately 2*l.* 1*s.*, made up thus:

	£	s.	d.
Educational Institute's Preliminary - fee			
(say, two sittings)	1	10	0
Tuition-fees (say, six months)	5	5	0
Registration-fee to the Pharmaceutical Society	2	2	0
	£8	17	0

Of course, if a student passed the examination at one sitting there is a saving of 10*s.*, but few do so. Under my scheme the fees would be—

	£	s.	d.
Examination-fee	1	11	6
Tutor (if necessary)	2	2	0
Registration	2	2	0
	£5	15	6

—thus saving almost 3*l.* 3*s.* Employers, especially in country districts, would reap the benefits of the scheme by getting

apprentices with less difficulty. Lads will not enter a trade where their leisure is limited, if they have heavy studies also.

Let those in authority carefully consider this question. It is in my capacity as a tutor that I have come to see the lads' difficulties.

A. H. SCOTT.

The only observations that need be made on the foregoing are:

(1) The difficulties of passing the examination after apprenticeship are so great that students should pass it before—viz., while at school.

(2) The Pharmaceutical Society deliberately increased the number of examination-subjects and the range of all. The Society is not at all likely to reduce the standard.

(3) The number of chemists' apprentices has diminished enormously since the examination was increased in stringency, and at present the supply is less than a fourth of that required to fill the ranks of qualified men.

(4) In many schools in England and Wales it is customary for boys and girls to pass the College of Preceptors' examinations while at school. As the second-class certificates of that College are accepted by the Pharmaceutical Society, the difficulty of registration is not formidable.

Mr. Scott's suggestion for a joint Board is nevertheless of considerable interest, and we may return to the matter in a future issue.

The Qualifying Examination.

The following notes serve to show generally the nature of the Minor examination of the Pharmaceutical Society of Great Britain, which all persons must pass before they can be registered as chemists and druggists:

The "Minor" examination of to-day is much more thorough than it was, say, ten or fifteen years ago. The subjects of examination, though nominally the same, are taken on a much wider basis, and the student now has to study them more from a purely scientific point, often thus missing their special application to pharmacy. This requires longer time for study, and unless the individual has practically covered the ground in his private reading prior to entering a school of pharmacy it is impossible for him to prepare for the examination in three months, which, I believe, was often done in years gone by.

Prior to July, 1891, the examination syllabus was very restricted, as a glance at one of that date or previous would show. The examination was concluded in one day, and practical chemistry was an almost unknown quantity in it; but the general public was becoming more and more educated, especially in our large centres, and it was evident that the future pharmacist, to hold the position his predecessors had done, must have a deeper knowledge of things and of pharmaceutical subjects in particular. So in 1891 the scope of the examination was considerably extended and the subjects better defined. In materia medica the modes of collection and of obtaining raw drugs for the market, and the names of the active principles in them, were added; and it was only a step further to demand the percentages of active principles in fair samples, and often the means of their extraction and assay, as was done in the further extension in 1899.

In botany the use of the microscope was introduced to recognise the anatomical structure of parts, a knowledge of the physiological changes which go on in the living plant-tissues, and an insight into the processes of reproduction as illustrated by higher and lower plant life, together with a general knowledge of classification, were added to the syllabus.

In chemistry the changes were most marked. Practical work was demanded, which developed the examination into a two-days' one, the candidate being under examination more than twice as long as formerly. This branch of the examination is continually increasing in difficulty; double salts have replaced single ones, and from simple estimations of B.P. chemicals by volumetric analysis more scientific knowledge and application of this means are now required. The introduction into the examination-room of professorial examiners in 1895, with little or no sympathy with pharmacy, demanded the studying of the theory of chemistry on more general lines, to the exclusion of pharmaceutical chemistry. The organic branch of the subject had to be studied not from its pharmaceutical aspect, but from a classification-point, the relationship of compounds one to the other, and their transformations.

These additions all place a greater tax on the student, and offer a wider field to the examiner for his selection. When one considers that the candidate must satisfy different examiners in the several subjects at one and the same examination, it can safely be said that it is very searching, and that only the best are able to go through the ordeal successfully.

H. LUCAS.

Here, again, it is a teacher who speaks, and his words are not mere opinions, but real experience which many could endorse. Mr. Lucas necessarily speaks of the average man

who has entered the drug-trade in order to make a living. These comprise 90 per cent. of those in the trade—that is to say, about 10 per cent. are gifted with either brains or money that enable them to pursue a more academic course, so that they may take a more professional position. There have been many attempts during the past sixty years to secure for pharmacists

A University Education,

but it has only been realised in the case of the Victoria University (Owens College, Manchester), and that after long trial. In 1843 a course of twelve lectures on pharmaceutical chemistry was delivered by Mr. John Davies, lecturer in chemistry at the Royal Medical Institution there, and a course of lectures on medical botany was given in the spring. Within six years they were stopped. When the 1868 Pharmacy Act passed another attempt was made to arrange courses of lectures and practical work with the Manchester Royal School of Medicine, and with the Owens College, with which pharmacy now became associated for the first time; but the enthusiasm was not lasting, and at the beginning of the 1871-72 session the classes were stopped. In 1873 Owens College (founded in 1851) went to the buildings it now occupies, and in 1883, under the direction of the late Professor Leech, with Mr. Wm. Elborne, Ph.C., as a lecturer, a definite pharmaceutical department was founded. It is this department and its work which serve to illustrate the academic style of education in pharmaceutical matters here described:

The pharmaceutical department is located in the medical school, and forms part of the department of materia medica, pharmacology, and therapeutics, of which subjects Dr. R. B. Wild is "Leech" Professor, and Mr. James Grier, Ph.C., Demonstrator and Assistant-Lecturer. The subjects of materia medica, pharmacy (including practical pharmacy and dispensing, pharmacy law, and prescription-reading), and pharmaceutical chemistry are taught in this department, the student attending the science side for lectures and practical instruction in pure chemistry, physics, and botany. The course for the Minor examination extends over one winter session—from October to the end of March—and the course for the Major examination occupies a similar period. All the courses are completed by the end of March, so that any student who has made good use of his time during apprenticeship and attended science classes may present himself for the Minor examination in April. Other students, as well as those who may have failed to satisfy the examiners, extend their work through the summer session, which consists of revision and practical work, and present themselves for the July examination; but no student can enter for the summer session only.

One of the great advantages which a University college with a pharmaceutical department possesses for pharmacy students is that those of them who desire to obtain the degree of B.Sc. and who have passed the Preliminary examination of the University may so arrange their courses for the Minor and Major pharmaceutical examinations as to include the other subjects required. The same applies to those who have passed the London Matriculation examination. This is an important saving of time, as it necessitates attendance at college for one more year only in addition to the two years spent in preparing for the Minor and Major examinations, and which, if taken elsewhere, do not count. The best plan would probably be to devote the first year to the subjects of the Intermediate Science examination, which would be taken at the end of the first year, chemistry, physics, and biology being the subjects chosen. The second year could be devoted to the pharmaceutical subjects required for the Minor examination, which would be taken in April of the second year. The student would at the same time attend advanced courses in organic chemistry and botany, and would thus be able to present himself for the Major examination in June of the second year. The pharmaceutical courses are now arranged in Owens College so as to allow of this being done. The third year would be devoted to special work leading up to the B.Sc. Final examination.

In the scheme which Mr. Wm. Kirkby brought before the Manchester Pharmaceutical Association in February, 1903, it is proposed that "pharmacistics" be accepted along with, say, chemistry and botany, as one of the three subjects for the Final B.Sc. examination. Under this scheme students who had passed the Preliminary examination before entering the College, and the Intermediate at the end of the first year, would present themselves for the Final examination at the end of the second year, but they would not be permitted to proceed to their degree until they had spent a third year in study approved by the Board of Studies. This is already done in the case of candidates for the degree of B.Sc. in agriculture. The candidate would thus be able to devote the whole of the third year to research or special studies, such as chemical and microscopical analyses of food and drugs, pharma-

cology, and therapeutics for the examination of the Institute of Chemistry.

It is impossible to give with exactness the cost of a degree course in science, as this varies with the subjects chosen and the nature of the degree, but the average cost of an ordinary B.Sc. degree course at Owens College is between 20*l.* and 25*l.* per session.

What has been said with regard to degrees in science applies also to degrees in medicine. The College classes in chemistry, physics, and botany, which the pharmaceutical student attends, and which prepare for the Intermediate B.Sc., also prepare for the first M.B. examination of the Victoria University and the Preliminary Scientific (M.B.) examination of the University of London. Zoology is the only other subject required, and candidates may take chemistry and physics at one time and biology at another. It is possible to study for both the Minor and the first M.B. during the same session, and at least one student who did this passed both examinations at his first appearance—the first M.B. in July, and the Minor in the October following. Another, after passing the Minor and Major from Owens, worked up his zoology in the evening at an institution recognised by the Conjoint Board, and passed the First Medical examination of that body in two parts while in a situation, taking chemistry and physics at one time, and biology and pharmacy at another. The expenses of the course for five years for the Victoria University degree of M.B., including College, Hospital, and University fees, amount to about 160*l.* Medical students who propose to take a University degree must be careful to fulfil the requirements of that University, and the first requirement is to pass the proper Preliminary examination, which in the case of the Victoria University (Faculty of Medicine) must include mechanics. Keeping in view the requirements of the Pharmaceutical Society, the pharmaceutical student should include Latin, mechanics, and either French or German in his Preliminary examination. In the Preliminary examination for arts or science only two out of the five subjects are compulsory—viz., English and mathematics.

It is impossible to touch on the social life of the College in this article, but no distinction of any kind exists between the different classes of students. The College athletic ground, about twelve acres in extent, is on the Firs Estate at Fallowfield, easily accessible by tram, and pharmaceutical students are at liberty to join any of the clubs of the Athletic Union. The friendly feeling which exists between the medical, dental, and pharmaceutical students was evidenced recently in a very practical manner, when a resolution that "dispensing by doctors and prescribing by chemists are both undesirable" was carried unanimously at a meeting of the Medical Students' Debating Society. The writer feels very strongly that this association in their studies and sports of medical and pharmaceutical students cannot but be productive of the happiest results to both.

JAMES GRIER.

An endeavour is at present being made in Scotland to get the Universities there to establish a degree in pharmacy, such as that referred to in the foregoing article. It is a mistake to think that a degree will carry a man through life; it is the training that does the thing, and if one does not go through that with an eye to the adaptation of the knowledge to business-life, the course for a degree will be largely wasted time.

It will be useful to contrast with the foregoing the pharmaceutical educational establishments in Germany as outlined in the following article by a graduate of Marburg University, who is also a Major man. He tells

WHERE TO STUDY IN GERMANY,

and gives particulars of the conditions which students of pharmacy must conform to.

German Universities may be divided into working centres and those at which drinking, club-life, duelling, and other forms of enjoyment are considered more important. In view of this state of things, I propose to indicate the localities at which an English student may be certain of the best advantages from a working point of view.

Marburg in Hessen, at which Professor Schmidt lectures on pharmaceutical chemistry with an inseparable love for alkaloids, and Professor Zincke works in general technical chemistry, with a strong bent in the direction of aniline colours, is undoubtedly one of the best centres, if not the best, for the pharmacist. The old town is situated in the midst of beautiful forest scenery.

Munich in Bavaria.—An enchanting city. Here Professor v. Baeyer, an adamant master, teaches chemistry, and particularly that of a technical nature. There are, I believe, about three hundred pharmaceutical students working at this University.

Würzburg in Bavaria.—Here Professors Thiele and Wislicenus lecture, and Röntgen worked until quite recently. There is a considerable number of English students.

Berlin, where Van't Hoff, Röntgen, and Emil Fischer are now

resident. The chemistry of foods and drugs has received considerable attention under the direction of Professor Thoms, of the Pharmaceutische Institut at Dahlem (incorporated in the University). I noticed recently that all the students are compelled to insure against accident. The premium payable amounts to only 5*s.* per term, and the payments are 2*s.* a day for temporary harm, 900*l.* for total disablement, and in the event of death 250*l.* is paid by the insurance company with whom the arrangement has been made.

Erlangen (Professor Fischer) is a small University permitted to take students without a stringent qualifying examination.

Königsberg in Prussia has about four hundred pharmaceutical students.

Darmstadt in Hessen (Professor Richter).—This is not a University town, but it possesses an important Polytechnische Hochschule. These technical schools, according to the Kaiser's recent decision, have now the power of conferring degrees—in fact, they are fast competing in importance with the Universities.

Gießen.—A quiet little town associated with Liebig's name.

Heidelberg.—A fashionable centre.

The Universities of Zurich, Berne (Professor Tschirch), and Basel in Switzerland also offer advantages, and are sought by cosmopolitan students. It may here be noted that those with plenty of time on their hands travel from one University to another, staying a semester or two at each, and picking up the best offers in the way of special lectures and opportunities for laboratory-work.

Every University has three faculties—the philosophical, the theological, and the medical. The philosophical one includes every science that cannot be classed under the other two; it therefore claims the pharmacist.

To enter a German University a grammatical knowledge of the language is desirable. The mastering of declensions, verbs, and genders will stand one in good stead, where others, depending solely on colloquial training (as often do our American cousins) will be for ever offending the critical professorial eyes and ears.

It is just as well to arrive at the University town a week or so prior to the commencement of one of the terms to secure a choice of rooms. The "semesters," as these are called, begin about the middle of April for the summer half, and the middle of October for the winter term. The official vacations consist of about a month from the middle of March to the middle of April, and two months from the middle of August to the middle of October; an interim also occurs at Easter, Whitsun, and Christmas.

The English student should go fully provided with credentials, school and college diplomas and certificates. He should have the London Matriculation or a substantial equivalent, and, above all, he should not forget his passport. If in addition to these there is the Minor or Major of the Pharmaceutical Society of Great Britain, so much the better.

For the purpose of the Ph.D. degree the student will have to satisfy his examiners in one principal subject, which, we will say, is chemistry, and two secondary subjects, which may be selected from botany, physics, mineralogy, or geology; probably the first two will appeal most to the pharmacist. In addition there is a sound grounding in the principles of philosophy—i.e., logic—a subject so wide and so absorbing that it is the custom of the humble aspirant to devote his attention to one of the comparatively simple works of say, Kant or Lange, or some other great master of thought.

If, on arrival, one's qualifications are thought sufficient, the student will commence on his "Arbeit"—a special thesis or study of some branch of the principal subject, entailing practical and original research—which will keep him engaged in the laboratory for a year or more—in fact, until the professor is satisfied that the work done will form a creditable "Arbeit" and the "Doctorand" (as he is now called) is ripe for the ordeal of the examination. If, however, his previous work has not been extensive, there will be a good training in general ordinary analysis and in the examination of foods and drugs before the "Arbeit" is thought of. The "Arbeit" has to be written in Latin or German, and at certain Universities the author has to read it publicly, and there is a public "disputation" at which he has to defend his results.

The actual Doctorate examination is *viva voce* in the four different subjects, and is conducted by the professors whose lectures one has heard. No matter how proficient the student may think himself, on entering the University it is desirable to take up the various professors' lectures to learn their own particular ideas and fancies. In the examination in chemistry it is the custom for the professor to adhere closely to "pure" chemistry. The lectures, as a rule, start at seven o'clock in the morning in the summer semester and at eight in the winter. The first three hours will be devoted, for example, to botany, physics, and chemistry, after which there is work in the laboratory until five or six in the afternoon, then an adjournment to "philosophy," and a hasty return to the laboratory to make sure the crystallising-dishes will produce their master's desires overnight.

The fees for the lectures are moderate, amounting to, say, 8*l.* or 10*l.* per semester. There are, in addition, numerous interesting

subjects, both scientific and literary, which are "public"—i.e., free to every student.

There is no indoor living in the German Universities. The tradespeople are glad to provide accommodation for about 4/ or 5/ per semester. The midday meal is the principal one during the day, and can be had at 1s. 6d. or so at a restaurant, usually in company with a group of congenial spirits. A German student will be content with a room at 12m. a month; breakfast and abendessen will be home made, and his midday repast will amount to 80pf. (9d.).

The books necessary for study may be reckoned at 20/, though this figure may be increased to an enormous extent should one be unfortunate enough to become infected with a mania for collecting works of reference. The examination-fees are from 15/ to 20/ (they vary according to the University), and the "Arbeit" costs another 20/ or so to print. This printing of the thesis is compulsory. One must not forget, however, in reckoning the expenses, that the materials for the thesis often run into very considerable figures. A friend of mine consumed carboys of alcohol and ether in his "Arbeit," and another used up silver nitrate to the value of 50/. Added to these sundry outlays, which I have been asked to indicate, one must not forget travelling-expenses both for work and pleasure.

This outlines the sojourn in the foreign land. No one who has completed it ever regrets his happy student-days.

W. HARRISON MARTINDALE.

The next article is devoted to the degrees of

The University of London.

It is written by a doctor of science of that University, who is perfectly familiar with the aspirations and performances of students of pharmacy.

The conditions under which degrees are granted at London University have been materially modified in almost all the faculties during the last few years in consequence of the reorganisation of the University and its acquisition of teaching-powers. The most important change is the recognition by the University of two classes of students—viz., internal and external—and before proceeding to outline the scope of the qualifying examinations for degrees, it will be convenient to state briefly the nature of the distinction drawn between the two classes.

INTERNAL STUDENTS.—The University regards as internal all students following its prescribed courses of study at recognised colleges, schools, and institutions (a list of these can be obtained on application to the Principal: it includes practically all public educational institutions in London and the environs). A student may be recognised as internal at any period of his University career, provided he has passed the requisite examination or examinations, and registers himself for a prescribed course of study at one of these schools.

EXTERNAL STUDENTS, on the other hand, may take lecture-courses where they like, or may read privately with or without the help of a coach. The only conditions to be fulfilled are that they must be at least sixteen when they matriculate, and that a certain fixed time must elapse between their passing one examination and sitting for the next higher one.

ENTRANCE EXAMINATIONS.—The first step towards a degree may be achieved in three ways:

- (a) By passing the Matriculation examination.
- (b) By obtaining a degree at a British, colonial, or foreign University.
- (c) By securing a "Leaving" certificate of the Honours grade from a Scotch school or a "real-gymnasium" certificate in Austria or Germany.

The London Matriculation examination is held in January, June, and September of each year (fee 2/). The candidate must be at least sixteen years of age, and must send in with his fee a certificate of good conduct (this condition applies to all London University examinations).

THE SUBJECTS OF EXAMINATION are: (1) English (one paper), (2) elementary mathematics (two papers), (3) Latin or elementary physics, chemistry, or botany (one paper), (4) two subjects selected from a list comprising most of the "dead" and living languages, logic, history, and the more important sciences, including advanced mathematics; a subject selected in (3) may not be again taken under (4). It will be observed that Latin is no longer compulsory, but it should be taken by pharmaceutical and medical candidates, since it is required for their professional Preliminary. The other two optional subjects selected will depend largely upon the candidate's taste and previous training, but probably the best choice would be French and German, leaving science for the future.

INTER. B.Sc.—This examination is held once a year—viz., in July (fee, 5/). In the case of internal students, arrangements are made to hold special examinations at the internal colleges, and in some cases parts of the sessional college examinations do duty for examination in the same subjects by the University. The candidates may choose four out of six subjects—viz., mathe-

matics, mechanics, chemistry, physics, botany, and zoology (internal students may also select geology); two papers are set in each subject, and in addition there is a practical examination in each of the natural sciences. The syllabus in chemistry and botany is similar to that for the "Major," but the papers set are usually more difficult, although the practical work in chemistry is easier; the "Major" physics is quite useless for the "Inter."

FINAL B.Sc.—This examination is held in October of each year (fee, 5/). Internal students must have taken one of the courses prescribed by the University, and may take "pass" papers in three subjects, or "honours" papers in one science, including its related sciences. In the former case two, and in the latter six (eleven in mathematics), papers are set in each subject. Thus the B.Sc. may be obtained by taking honours in chemistry, with physics, botany, geology, and physiology in their relation to chemistry as subsidiary subjects. External students may take "pass" papers in three subjects, or "honours" papers in one and pass papers in one or two other sciences. The subjects available, in addition to those for the "Inter.," are physiology, geology, psychology, and logic (for internal students, astronomy is substituted for logic). The scope of the syllabus in each subject for this examination is wide, but the pass papers set in chemistry and botany could usually be successfully negotiated by a man who has studied honestly for the "Major," and has extended his botanical reading on the cryptogamic side and has some acquaintance with physical and historical chemistry. The "honours" papers, however, cover so wide a range, and vary so much in character with different examiners, that a special course of reading is necessary before they can be attempted with any hope of success. The B.Sc. may now also be taken by "research," provided the candidate can satisfy the Senate of his fitness to undertake such work, and is prepared to work for two years at a selected subject in a school of the University, and submit a printed thesis thereon at the end of that time.

D.Sc.—Special inducements are offered by London University to science graduates of other British and colonial Universities to enter for the D.Sc. A colonial B.Sc. may, by obtaining a certificate of fitness from a recognised teacher of the University, be admitted as a candidate for the doctorate. He must, however, subsequently spend two years at research-work in a school of the University, and at the end of that time submit a satisfactory thesis and pass an examination, the scope of which is at the discretion of the examiners. The external student may enter for the D.Sc. two academical years after graduation. He must submit a satisfactory thesis, and, unless he obtained first class honours in his subject at the B.Sc., must undergo examination at the examiner's discretion. The fee is 10/ (after 1905 it will be 20/), and the examination is held in June of each year.

LONDON DEGREES IN MEDICINE AND SURGERY.—The new regulations for these degrees have not yet been issued by the University, and it must be understood that the outline given below refers to regulations in force up to June, 1903. The principal change, it is stated, will be that candidates may take the M.B. and B.S. at one examination.

THE PRELIMINARY SCIENTIFIC is held twice a year at present—viz., in January and July. The subjects are (a) physics and chemistry, and (b) biology, the papers set being identical in scope with those set in the same subject at the Inter. Sc., which may be taken instead. The "Pre. Sc." candidate may, however, take parts (a) and (b) at two different times. The fee is 5/.

INTER. M.B.—This examination, for which the fee is 5/., is held in January and July of each year, but Honours papers may be taken in July only. Candidates must be at least nineteen years of age, have passed two years in following a prescribed course at a recognised school, during which they must have dissected for two sessions and taken a course in practical chemistry of what may be called a medico-pharmaceutical type. The subjects of examination are anatomy, physiology and histology, materia medica, with organic and pharmaceutical chemistry. In each subject there is a practical examination. The papers set in chemistry and materia medica should be easily within the grasp of a "Major" man provided he has paid some attention to therapeutics.

M.B.—The Final examination is held in May and October (Honours papers can only be taken in October). Fee 5/. Twenty-one months must elapse between passing the Inter. M.B. and taking the Final; in addition, the candidate must have taken a prescribed lecture-course, have had two years' hospital practice, during one year of which he must have been in charge of patients, and must produce certificates of proficiency in midwifery and vaccination, and must have spent at least two months each in lunacy-practice and in that of infectious diseases. The subjects of examination are obstetric medicine, general pathology (including therapeutics and hygiene), surgery, medicine, and forensic medicine.

M.D.—This examination is held annually in December (fee 10/). The candidate must have spent, after graduation, two years in hospital practice (unless he graduated in the first division, when one year's practice is excused), or one year's hospital and three

years' general practice before or after graduation. The degree may be taken in either medicine or State medicine, in which subject papers are set together with papers on mental physiology in relation to mental diseases. In place of this examination a thesis embodying original work or observations may be submitted.

B.S.—The examination for this degree is held in December (fee 5*l.*), and must at present be subsequent to graduation in medicine. The candidate must have attended a course of instruction in surgery, and is examined in theoretical and practical surgery, the latter by reports and comments on surgical cases.

M.S.—This examination is held in December (fee 5*l.*), and can only be taken after two years' hospital practice in surgery subsequent to graduation or five years' general practice—a reduction of one and two years in these periods respectively being made in the case of candidates placed in the first division at the B.S. examination. The subjects of examination are mental physiology, surgical anatomy, and practical surgery, with commentaries on complex surgical cases.

What the Examination is Like.

Of considerable interest to students is the following account of the recent Intermediate Science examination, the first examination under the new Internal examination regulations of the London University:

The Internal and External examinations commenced on July 13, and were strictly contemporaneous, but they were kept rigidly separate by the subjects being different on the same day; the papers were therefore quite distinct. While over six hundred entered for the External examination, only fifty-nine ventured on the Internal, of whom between forty and fifty were ladies, strongly contrasting with the distribution of sexes on the External side. Papers were set in seven subjects, including mechanics, geology, zoology, and the four under-mentioned, which are of more immediate interest to pharmacists:

(i.) Pure mathematics, not appreciably more difficult than the External.

(ii.) Botany. A wider and more intimate knowledge was expected of the Internal than of the External candidate, especially with regard to general detail, to evolution as exemplified by comparison of certain types, and to the stages of development of given organs and tissues.

(iii.) Chemistry. About the same as the External. The practical was vastly improved by giving two volumetric (oxalic acid by NaOH and by KMnO_4 , and discussion of the relative merits of the processes) and two qualitative analyses, to be done in three hours, instead of, for External, half the work in half the time.

(iv.) Physics. Rather more advanced than the External, a better comprehension of the more elaborate experiments being required. The practical came as a surprise. Instead of the hasty performance of some half-dozen elementary experiments, as has been customary for the External, candidates were required during the first half-hour to write a short account of four experiments, and then during two and a half hours to properly perform one of them, which might be selected by the candidate; but his selection was not guaranteed. Here are some of the exercises set: (a) Determine the specific heat of the given solid by the method of mixtures; (b) Find the refractive index of the given prism for sodium light by means of a spectrometer; (c) Plot the direction of the magnetic field due to the earth and the given bar-magnet at various points either (i.) along or (ii.) across the axis of the bar-magnet, and hence determine its magnetic moment, given $H = 18$; (d) Compare the electrochemical equivalents of copper and hydrogen. This method of conducting the practical physics is much to be preferred to the old, except for two serious faults—namely, that the candidate's experience in such a typically wide subject as physics was concluded from a single experiment; and that candidates were allowed to select their exercises, with the result that some got their choice while others had to rely on that with which they were scarcely familiar. This is wittingly introducing in a virulent form that element of chance which is one of the worst features of the examination system.

Questions in French and German were set in each subject. In mathematics and botany they were optional, but in chemistry and physics they were compulsory. In mathematics and physics several questions involving graphs were set, with particular reference to deductions that can be made from the curve. In every paper a selection of questions was allowed.

It will thus be seen that the "Internal" system is a great advance upon the "External," both in standard and in method of procedure—as, indeed, it is intended to be. As yet it is impossible to say by how much the two degrees will diverge; but if the University authorities gently but persistently press in the right direction, so as to secure for Internal graduates the improved status proposed, in the course of a few years an Internal London degree should be one of the most honourable of all such distinctions.

Preparation for London Degrees.

The Matriculation examination in its present form should present no difficulty to a boy or girl who has received a sound education at a good secondary school. It may be mentioned that most rejections take place in Latin though German runs the dead language close in this respect. A moderate acquaintance with German and French is useful to either a commercial man or a scientist, and for this reason both these languages should be taken at matriculation to afford a groundwork for the acquisition later of a colloquial knowledge of the languages. For the "Inter. Sc." the Major man would require little help in chemistry or botany, and the other best subjects would be pure mathematics and physics, unless he has no mathematical bent, when he should substitute zoology for mathematics. For the Final B.Sc. the pharmaceutical candidate will as a rule select chemistry and botany, and the third subject will depend entirely on his taste; he will find either physics, mathematics, or geology fit in well with chemistry, and each has its special attractions. As regards the method of preparation everything depends on the time and money available. It should be remembered that in the future more prestige will probably attach to an "internal" than to an "external" degree and since the former can be taken by attendance at certain of the "polytechnics" in the evening, its attainment presents no difficulty even to a man in business provided he can get away in the evenings. On the other hand, the candidate would benefit infinitely more by devoting his whole time for three years to the acquisition of a degree, and during this time he would not find it difficult to negotiate in addition the Minor and Major examinations.

Candidates for London medical degrees have no option in the matter of devoting a number of years entirely to study, but they can select any of the British medical schools for their sphere of work. Considering the high prestige of most of the schools in London and their unique opportunities for the acquisition of experience, it is doubtful whether a student native to London or resident in it could do better than take his medical course in London. We now turn to consideration of

Medical Qualification in the Three Kingdoms.

Our purpose in the three succeeding articles is to enable those who think of entering the medical profession to count the cost and become familiar with the conditions they have to fulfil.

M.R.C.S.ENG. AND L.R.C.P.LOND.

This qualification, generally known as the "Conjoint Board examination," or "Double Qual.," is obtained by examination at the end of five years from date of registration as a medical student. The choice of a medical school must be left to the intending student. All information concerning each in particular can be obtained from the dean or warden connected with each. Fees, which include admission to all lectures, demonstrations, and hospital practice, during the whole time the student is training range from about 125*l.* to 169*l.*, and may generally be paid by instalments.

Either May or October should be selected as the time of entrance, as these months mark the beginning of the two sessions. During the first year lectures and demonstrations on biology, chemistry and physics, and *materia medica* fully occupy the student's time. These three subjects form the three parts of the First Professional examination, and may be taken either singly or together. Fee 10*l.* 10*s.*

Books.

Chalmer's Mitchell's "Biology."
Marshall's "Frog."
Luff's "Chemistry."
Rivers Wilson's "Chemical Physics."
Rivers Wilson's "Materia Medica."
Ganot's "Physics."

Between times, lectures on anatomy and physiology and actual dissections of the human body should be attended.

Anatomy and physiology (including histology), the subjects of the Second examination, must now be fully attacked. The dissection of the various parts of the body must be carefully carried out. Each "part" costs the student about 12*s.* 6*d.*, so that nearly 5*l.* in all is required to pay this item. A microscope with slides and cover slips, and about three good lenses, are required for histology. A dissecting-case is needful, also a box of bones.

Books.

Gray's "Anatomy" (for reading).
 Cunningham's "Anatomy" (for dissecting).
 Starling's or Kirke's "Physiology."
 Halliburton's "Essentials of Physiology."
 Schäffer's "Essentials of Histology."

The examination in both subjects must be passed at the same time. Fee 10*l.* 10*s.*

The student now enters upon the most interesting part of his work, and begins to "walk the hospitals." Six months as clinical clerk in the medical wards, and six months as surgical dresser in the surgical wards, three months' clerking in the *post-mortem* room, and attendance at at least twenty maternity cases as maternity assistant, besides lectures on medicine, surgery, midwifery, pathology, public health, therapeutics, bacteriology, medical jurisprudence, and toxicology, and attendance at the out-patient departments, fully occupy the time until the end of the fourth year, at which period a part of the Final examination—*i.e.*, midwifery and diseases of women and children—may be taken. After this, attendance at a fever-hospital for a course of three months' training, a certain number of visits to a public vaccination station, and a lunatic asylum (no fees).

Fever-hospital fees	£	s.	d.
Vaccination fees	1	11	6

At the end of the fifth year, medicine and surgery may be taken, thus completing the Final examination; fee 2*l.*

Books.

Herman's "Diseases of Women."
 Herman's "Difficult Labour."
 Dakin's "Midwifery."
 Walsham's or Rose and Carless's "Surgery."
 Treves's "Surgical Anatomy."
 Bowlby's "Pathology."
 Taylor's or Osler's "Medicine."
 Smith's "Jurisprudence and Toxicology."

Of course, many other books than those mentioned here would be useful; only those quite needful have been advised. Others can be read in the library of the medical school.

I would strongly advise the student to enter the athletic side of the medical school. Many a promising and brilliant student has been unable to stand the strain of hospital work through neglecting to take sufficient and proper exercise. Five years has been mentioned as the time required for qualification, but only a very few are ever able to finish in that time. Six years is really a proper estimate. All medical schools offer valuable and numerous scholarships which help to, or in some cases entirely, pay the heavy fees.

The prices of the various books required have been purposely omitted, because second-hand books, if of recent editions, do quite as well as new ones.

SCOTTISH UNIVERSITY DEGREES IN MEDICINE.

The following outline is based on the regulations in force in the University of Edinburgh, and applies, with slight modifications, to the other Scottish universities.

PRELIMINARY EXAMINATION.—In this there are four subjects—English, Latin, elementary mathematics, and Greek or French or German. In English a three hours' paper is set, containing an essay, a paraphrase, two questions on history, two on geography, four on grammar, and two of a literary and general kind. The historical questions cover the whole of British history, but are set in such a way that the candidate has an opportunity of showing his knowledge of any single period to which he has devoted special attention; the literary questions are set on a similar principle, the candidate having an opportunity of showing his knowledge of famous literary works. The Latin includes translation and parsing, prose composition, grammar, and sentences, but no book is prescribed for special study. Mathematics includes arithmetic, as far as vulgar and decimal fractions; algebra, as far as easy quadratic equations, and problems including them; geometry, including the first three books of Euclid, with easy deductions. Greek includes translation, sentences, and grammar, and French and German are on a similar standard. Candidates holding degrees in arts or science are exempt from the Preliminary examination. With certain provisos, Oxford and Cambridge Higher and Senior Local examinations are accepted *pro tanto*, as are also the London and Victoria University Matriculation examinations and certain others; the Scottish Education Department Higher Leaving certificate is accepted, and also the Lower Leaving certificate, provided that in the last case all the necessary subjects have been passed at not more than two examinations. To anyone fresh from school, and who has had a good modern education, the examination presents no great difficulty, but to a man who has been engaged in business for some time there is no doubt that considerable concentration is necessary in order to pass.

PROFESSIONAL EDUCATION AND EXAMINATIONS are spread over a period of five years, and candidates must produce evidence of having studied for that period. The University authorities usually recommend students to commence in the summer, but to pharmacists this is not advisable, as they are already fairly familiar with the first year's subjects, and they finish at the same time by commencing in the winter, thus saving about five months. The first winter session is devoted to physics, chemistry, and practical chemistry, with anatomy lectures. Students are not recommended to start dissecting in their first session, but the writer strongly advises pharmaceutical students, to whom the first year's work should be easy, to spend all the time they can spare in the dissecting-room; it will save a great deal of worry in the third winter. The summer session following is devoted to botany and zoology, and in each there is a practical class, which, although not theoretically compulsory classes, are really necessary to anyone wishing to make sure of getting through.

At the end of the summer the final part of the First Professional is cleared off, presuming that chemistry and physics have been passed at the end of the previous winter. To most students the First Professional work is at the present time found to be the stiffest of the whole curriculum, the failures in Edinburgh, in chemistry, at the last examination being something like 70 per cent. To the pharmaceutical student, however, it offers no real terrors, although even he will find it requires steady work.

In the second year begins the real, and at the same time most interesting, part of the curriculum. One hundred lectures each on surgery and physiology have to be listened to, experimental physiology takes about two hours per week, all spare time is devoted to dissecting, and, after Christmas, surgical dressing and clinical lectures make the second-year's man feel that at last he is getting a peep at the realities of the profession which he has chosen. In the summer session following, dressing and clinical surgery and dissecting are continued, and two hours daily are devoted to practical physiology (histology); practical materia medica, the only subject from which pharmacists are exempt, is also taken by the ordinary student, and a terrific subject he finds it.

The third winter session is the stiffest in the whole course; it is devoted to anatomy (dissecting and demonstrations), one hundred lectures on materia medica (from which pharmacists are not exempt), and physiology. At the end of it the much-dreaded Second Professional should be passed, and there is no doubt that this examination involves a great deal of steady work and much concentration.

The following summer and winter are devoted to pathology, clinical medicine, and midwifery lectures, the Third Professional being taken at the end of the winter (pathology only). The remaining three sessions are devoted to dispensary and hospital practice, *post-mortems*, forensic medicine, public health, mental disease, eyes, ears, skin, children, vaccination, fevers, midwifery, operative surgery; and the Final is passed during the fifth summer session.

The financial aspect of the curriculum is much more serious than it was under the old regulations, not only from the fact that the increase in practical classes and in the knowledge of practical anatomy required make the fees much higher, but also, and mainly, from the aspiring pharmacist's point of view, that it is now practically impossible for any man to do any outside work during his curriculum, except perhaps, during the first year and during the vacations—the autumn one lasting rather over two months, and the spring one rather more than a month. With regard to the vacations it is almost a necessity that part of them should be devoted to practical hospital work, and it is certainly a necessity that a large slice should be consecrated to open air and mental rest. The total class, matriculation, examination, and hospital fees amount to about 150*l.*, and in addition to this there are books and instruments—an unlimited field for money-spending.

The cost of living in Edinburgh is, on the whole, high, but will entirely depend on the depth of the student's pocket and his capacity for "putting up" with things. It is certainly a very unwise thing for a man who is doing hard mental work to attempt to economise in his food bill; public opinion compels a certain standard in dress; and a student certainly does better work when his home surroundings are pleasant. On the whole, the single student could not do better than board at one of the well-conducted students' hostels of which there are now several in Edinburgh, and which offer board and lodging for about 25*s.* weekly. No doubt private rooms may be had at a less cost, but it would not be safe to put the annual cost of living, apart from fees, at a lower figure than 75*l.* To a married man with a family—and this class of student of medicine is not uncommon—the cost is very much greater, house-rent in healthy and nice localities being high, and food much dearer than in the average English town.

THE CARNEGIE TRUST pays the fees of all students of Scottish birth or extraction who apply and produce evidence of having passed the Preliminary. This applies only to class-fees, however, not to matriculation, examination, or hospital fees. Particulars and application forms may be obtained from the Secretary to the Trust, Harrower Street, Edinburgh. Full particulars of the Edinburgh—

burgh curriculum are obtainable by writing to the Dean of the Faculty of Medicine, University, Edinburgh, who will also furnish particulars of bursaries and scholarships, of which there is a fair number, some being worth 100*l.* per annum for three years. It should, however, be noted that those of any value are difficult to obtain, men being coached specially for them, and even then requiring considerable capacity for getting up examination work.

From the above brief review of the requirements of present-day medical examining boards and the cost in time and money of satisfying these requirements, it will be seen that the medical curriculum is not one to be entered on without first very carefully counting the cost. It would be folly for any man to enter on it unless he can see his way to keep himself in a fair standard of comfort for the necessary time. Provided he has satisfied himself on this point, and has a scientific bent and a pharmaceutical training, he will find the work especially of the later years, most interesting; at the same time, he must be prepared for a good deal of the disagreeable grind which is always associated with those so-called necessary evils—examinations. The pharmacist whose ideas of physiology, pathology, and medicine have been formed by reading books even ten years old will be astounded to find that entirely different views are now taken about many important diseases and their treatment, and he will be more astonished still to find how much practical science has to be put into the building-up of a diagnosis, and how accurate it is possible to make that diagnosis, as shown in the *post-mortem* room from time to time.

Having taken his M.B., Ch.B., the medical graduate can qualify for M.D. or Ch.M. by spending two years in practice or one year in hospital or research work; he has then to submit a thesis and pass a further clinical examination. The choice will, of course, depend on whether his bent is in the direction of surgery or medicine.

Finally, if a man's sole object in life is to make money, he had better stick to pharmacy. The doctor who takes a proper view of his profession will never make much money unless he is lucky enough to gain a reputation, with its attendant big fees, rapidly. Many men in general practice do make money, but unless they get good fees it is very hard work or the interests of their patients are apt to suffer, every case of any seriousness demanding the utmost concentration and attention.

MEDICAL AND SCIENTIFIC EDUCATION IN IRELAND.

The boy who starts at pharmacy may end as a F.R.S. or as a University professor, or he may finish his career as a harmless drug-shop drudge—it mostly depends on his Preliminary examination. Practically all the blunders are made at this initial step, and the chemist who contemplates letting his son follow the business, or who is asked for advice from friends, should be careful to emphasise this point. There are thousands of chemists who have imbibed a taste for scientific studies during their period of probation for their qualifying examination, and who would now vainly procure such a degree as a B.Sc., or a diploma in medicine, or qualify themselves as analysts or veterinary surgeons or dentists, and who would probably go through the required courses with distinction, were it not that they are appalled at the idea of going up for the Preliminary examination again. Such men have taken the Preliminary examination of one of the Pharmaceutical Societies, and it will not avail for a degree in medicine or science. It would not have been very much more difficult for a young man of application to take a Matriculation examination instead of this Preliminary in the commencement of his studies, but no chemist who has been eight or ten years from school likes to go back to his school books.

It is a matter, then, of the gravest importance to any young man who has the faintest hope of ever being anything more than a merely ordinary pharmacist that he should study for the Matriculation examination of one of the universities, instead of taking the Pharmaceutical Preliminary. Of course, he may take instead a Medical Preliminary, such as that held by the College of Preceptors, but though this will be more useful than the pharmaceutical, and is easier than the Matriculation, it will not help him if he wishes to take the B.Sc. or the F.I.C.

In Britain the London Matriculation is commonly recommended, but many embryo chemists regard it as beyond their powers. Now, practically all the privileges attaching to it belong to the Matriculation examination of the Royal University of Ireland, and it is not so difficult, because it is followed by two arts examinations before the student can present himself for the degrees, whereas at the London University there is but one—the "Intermediate." This is well worthy of the attention not only of Irish but of British students, as all the regulations are practically identical with those of London, and the essential subjects—Latin, French or German, English, mathematics, and natural philosophy—are of the same number.

Should the student obtain this Matriculation—for which the examinations are held in June and September, and the fee is 1*l.*—he can, if he wishes to devote himself to pharmacy, take in due course the Irish or the British certificate, or he may take both. If he happens to live in a city with the facilities, he can after-

wards attend the course of chemistry and physics at a college, and qualify himself for presentation for the Intermediate examination for the Associateship of the Institute of Chemistry, and finally present himself for the examination qualifying him to act as public analyst. Even should the student have no definite intention of becoming such, he must take the "A.I.C." if he wishes to be regarded seriously as a scientific chemist, and the examination in the section dealing with the examination of food and drugs and pharmacology is the one which should be the easiest path to the pharmacist seeking the certificate. The examination in Ireland is usually held at the Royal College of Science, Dublin, and students who think of entering for it should be careful to preserve the note-books, &c., which they use whilst taking out courses of chemistry or physics, as these are usually demanded as proofs of regular study. Students who have taken the degree of B.Sc. are usually allowed the Intermediate examination of the Institute of Chemistry, and those who have taken the degree of B.A. in the Royal University are also exempt, provided that they have taken honours in chemistry and physics and mathematics.

The regulations of the Royal University are very irksome for those who wish to take the B.Sc. One must pass not only the Matriculation, but the First Arts examination (comprising the same subjects as the Matriculation but more severe), the Second Arts examination, and, finally, the examination for the B.A. degree—all at intervals of at least a year. The drawback then is that, unlike at London, one must take the B.A. before being allowed to enter for the B.Sc., and the standard for the latter is the same as for the M.A., but if one should already have taken this degree, he will be required to take different subjects for the B.Sc. But, as has been stated, the B.A. will be sufficient if honours be taken in the required subjects.

Should the chemist's tastes lie in the direction of veterinary science, his Matriculation-certificate will be ample, but he must attend a four-years' course at a veterinary college in Dublin, Edinburgh, London, or Glasgow, and must also pass the required examinations. Many believe that for those with an agricultural connection, the calling of a veterinary surgeon is one which will very often prove much more lucrative than that of the ordinary medical practitioner.

Dentistry does not seem to offer many temptations to young chemists, who consider the course too long and costly and the restrictions as to advertising, &c., too stringent to induce many of them to enter the calling. Should the chemist be induced by it, and should he have the requisite Preliminary certificate, the course before him will be of three years' duration at a medical school.

The question for the chemist who desires to study medicine is what course shall he follow—the Apothecaries, the Conjoint Colleges, or the University? In Dublin the actual fees are not very different, but the Hall is the cheapest, perhaps—113*l.*; the Conjoint Board 141*l.*, and the Royal University about 131*l.* The actual fees of the University are the least of all—not more than about 8*l.* until the last examination is passed—but then there are several extra subjects, and the First University examination in Arts must be passed as well as the Matriculation. These examinations are such as demand the whole time of a man, and a pharmacist who can only snatch a couple of hours from his day for study will scarcely be wise if he diverts his energies from the prosecution of a more attainable diploma.

Contrasting the Hall with the Conjoint, it may be observed that chemists have now an advantage denied them a few years ago—namely, that the courses for chemistry and *matéria medica* need not have been taken at a medical school, and this may mean the saving of a ten-pound note. It is doubtful whether a change may not again be made in view of the recent action of the General Medical Council, so that every pharmacist who is anxious for the privilege should avail of it at once.

The required course of study is nearly the same for the Colleges and the Hall, but the latter affords an advantage as being a qualification in pharmacy, and hence would be more useful to the man who had not taken a pharmaceutical qualification. The examinations are probably, on the whole, somewhat easier, and the authorities are anxious to help young pharmacists as much as possible. Further, those who get the diploma are now allowed to enter for the Fellowship of the Edinburgh College of Surgeons, and thus to acquire a very respectable diploma. The Hall Licence is, in fact, the certificate for the man who can only hope to get through his medical course little by little. It is, further, much more suitable if he intends keeping his shop, as the authorities of the Colleges do not look with favour on those practitioners who do so, and are apt to give them worry. On the other hand, the diplomas of the Conjoint Colleges constitute a more desirable qualification for one going in for general practice, cost but little more, are not much more difficult, and work is, as regards the Final examination, easier.

We commend these articles to the intending student. He should read them carefully and ponder over them before deciding upon the course which he should pursue.

General Education.

IN the foregoing articles indications have been given of the preliminary education needed by aspirants to pharmacy, medicine, and science. We now propose to particularise the requirements of the various examining bodies. Up to July, 1900,

THE PHARMACEUTICAL PRELIMINARY

was conducted by the Pharmaceutical Society of Great Britain, as it still is by the Irish Society. The British Society now accepts the certificates of other examining bodies, and charges a registration-fee of two guineas. The following is the list of certificates at present recognised, but the certificates are subject in every case to the proviso that the examination passed included English grammar, Latin, a modern foreign language, arithmetic, algebra, and Euclid. Certificates of other bodies than those mentioned above can be submitted for the consideration of the Board of Examiners and approval of the Council, and if found to fulfil the conditions of the by-law will be accepted as an efficient Preliminary.

University of Oxford.

Junior or Senior Local examinations.
Responsions.

University of Cambridge.

Junior or Senior Local examinations.
Higher Local examinations.
Previous examinations.

University of Durham.

Junior or Senior Local examinations.

University of London.

Matriculation examination.

Victoria University.

Preliminary examination.

University of Birmingham.

Matriculation examination.

University of Wales.

Matriculation examination.

University of Edinburgh.

Preliminary examination for Graduation in Medicine or Surgery, or Arts, or Science.

University of Aberdeen.

Preliminary examination for Graduation in Medicine or Surgery, or Arts, or Science.

University of Glasgow.

Preliminary examination for Graduation in Medicine or Surgery, or Arts, or Science.

University of St. Andrews.

Preliminary examination for Graduation in Medicine or Surgery, or Arts, or Science.

University of Dublin.

Public Entrance examination.

Royal University of Ireland.

Matriculation examination.

Scotch Education Department.

A pass in the Honours, First Grade, or Lower Grade Leaving Certificates examination.

Intermediate Education Board for Ireland.

Senior, Middle, or Junior Certificates.

Central Welsh Board.

Honours, Senior, or Junior Certificates.

Educational Institute of Scotland.

Preliminary Medical examination.

Oxford and Cambridge Schools' Examination Board.

Examination for Higher or Lower Certificates.

College of Preceptors.

Examination for a First or Second Class Certificate.

NOTES ON ABOVE LIST.

It has been recommended by the English Board of Examiners that the acceptance of the certificate of the Preliminary medical examination of the Educational Institute of Scotland be discontinued, but, the Scotch Board of Examiners not having also approved of the recommendation, it remains in the list of accepted certificates. The fact that the whole of the subjects can be passed in more than two examinations is the cause of the English Board's recommendation.

Attention has been called to the fact that "geometry" is now substituted for "Euclid" in the Oxford and Cambridge Local examinations and the College of Preceptors' second-class examination, and both Boards of Examiners have agreed to accept geometry in place of Euclid.

In regard to the revised regulations for the London Matriculation, pharmaceutical students should note that examination is not accepted irrespective of the subjects passed, as under the revised regulations Latin is not a compulsory subject, nor is it essential that a modern foreign language be taken, both of which subjects are compulsory in any Preliminary examination accepted by the Pharmaceutical Boards of Examiners. The proposed Leaving Certificate examination of the London University will also not be accepted irrespective of the subjects taken, but if submitted will be considered on its merits.

Welsh, it may be added, has been decided not to come within the category of "a modern foreign language." Some pharmaceutical aspirants may possess Leaving certificates of the Scotch Education Department in a portion only of the six subjects required, in which case the remainder of the subjects may be passed under any one of the examining bodies specified above, provided always that the whole of the subjects are passed at not more than two examinations. This applies to all other examinations except the certificates accepted by the Scotch Universities for registration as medical students. The College of Preceptors' Second-class certificate and the junior locals of the Universities are considered the easiest of the examinations mentioned in the official list. In Scotland the Leaving certificate is perhaps the most popular with pharmaceutical aspirants, and is a suitable certificate to present for the Preliminary, providing the whole of the subjects are included or the deficiencies made good at subsequent examinations.

The certificate of having passed any one of the above examinations should be sent, together with the fee of two guineas, to the Registrar, Mr. R. Bremridge, 17 Bloomsbury Square, London, W.C.

COLLEGE OF PRECEPTORS' EXAMINATIONS

are held four times a year—the General examination in July and December, and the Professional Preliminary in September and March. The examinations are held in London and local centres. In the case of the Professional Preliminary, Birmingham, Bristol, Leeds, Liverpool, and Manchester are local centres. Other centres can be arranged, but candidates are required to pay their proportion of the extra expenses. Mr. C. R. Hodgson, B.A., Secretary of the College of Preceptors, Bloomsbury Square, W.C., will supply particulars of the proposed centres. The fees are for the July and December examinations 10s. 6d. and the local fee (to be paid to the Secretary of the College twenty-one days before the commencement of the examination). For the September and March examinations the fee is 25s., which is required to be paid fourteen days prior to the examination, together with the local fee payable when it takes place at a provincial centre. In the second class, or Junior examination, there are twenty-one subjects, but a candidate may not take more than ten. The following are the subjects in this division for December, 1903, only the six required for the pharmaceutical Preliminary being given:

1. ENGLISH.—Candidates may take *either* (a) a paper on general English grammar and analysis of sentences, *or* a paper on *one* of the following books: (b) Shakespeare's "Julius Cæsar," Acts i., ii., and iii.; (c) Shakespeare's "Macbeth," Acts i., ii., and iii.; (d) Scott's "Lord of the Isles"; in each case with analysis of simple sentences and easy complex sentences, and grammatical and other questions based on the text.

All candidates will be required to write a short English essay, and to paraphrase a passage of poetry; and no candidate will be allowed to pass who does not give evidence of his ability to spell correctly.

[More marks will be assigned to the papers which include a set book than to the general paper.]

2. LATIN.—Candidates are allowed to choose between a paper of "unseen" translation and a paper on *one* of the following books: (a) Cæsar, "Gallic War," Book II.; (b) Cæsar, "Gallic War," Book IV.; (c) Virgil, "Æneid," Book VI., 1-493; (d) Virgil, "Æneid," Book X., 1-509. Each paper will contain (a) passages for translation into English, including, in the case of papers on set books, at least one "unseen" passage; (b) grammar and questions arising out of the books set for translation into English; (c) simple English sentences for translation into Latin. In order

to pass, candidates must satisfy the examiner in at least two of the three divisions (a), (b), (c).

An additional *optional* paper will also be set, containing a more difficult unseen passage for translation into English, and an easy continuous passage for translation into Latin.

3. FRENCH, GERMAN, ITALIAN, SPANISH.—(a) Translation from the foreign language; (b) Grammar; (c) Translation into the foreign language; or free composition in the foreign language. In order to pass, candidates must satisfy the examiner in at least two of the three divisions (a), (b), (c).

4. ARITHMETIC.—Including simple questions on the metric system, but *excluding* cube root, problems on rate and time in interest, compound interest, and stocks.

5. ALGEBRA.—Including simple equations, fractions, and easy quadratic equations of one unknown quantity.

6. GEOMETRY.—Euclid, Book I, together with *either* Book II, or Props. 1-19 of Book III, or the subjects treated therein, with riders.

An alternative paper will also be set on theoretical and practical geometry, on the lines recommended by the Mathematical Association. Particulars respecting this alternative paper may be obtained from the Secretary.

The conditions of passing are that the candidate satisfies the examiners in at least five subjects, and obtains a total of not less than 400 marks. As a pharmaceutical student must pass in six subjects, this would necessitate him sitting again for the subject in which he failed. The setting of alternative papers in geometry is the new regulation to which reference is made above (page 317). Free composition in a foreign language may now be substituted for translation.

The papers set at previous examinations may be had from Mr. F. Hodgson, 89 Farringdon Street, E.C., price (post-free) 7d. each set.

EDUCATIONAL INSTITUTE OF SCOTLAND.

Examinations are held in Edinburgh, Glasgow, Dublin, and London three times a year, the next being on September 10, 11, and 12. The following are the subjects:

Compulsory, in which every candidate must pass:

1. ENGLISH.—Dictation, composition, parsing, and derivation. Outlines of British history. General geography of the world, with detailed geography of British Isles and British colonies.

2. LATIN.—Grammar, Cicero, "Pro Archia," and Virgil, "Æneid," Book VI, lines 1-402, translation of passages not taken from specified authors, and composition in Latin. (After this year there will be no prescribed Latin.)

3. MATHEMATICS.—Arithmetic, common rules, and vulgar and decimal fractions. Algebra, up to and including simple equations. Geometry Euclid, Books I. to III., with deductions.

Optional, one of which must be taken:

FRENCH.—Grammar, translation of English into French, and French into English.

GERMAN.—Grammar, translation of English into German, and German into English.

ITALIAN or any other modern language.

Defective spelling in any paper will involve failure.

Entry-forms, to be had from Mr. S. M. Murray, 40 Princes Street, Edinburgh, to be sent, with fee (1*l.*), five days prior to each examination. The fee for subsequent examinations is 10*s.* 6d.

The Institute Calendar containing examination-papers can be had from Mr. Murray, price, by post, 1*s.*

LONDON MATRICULATION.

This examination is held three times yearly—one examination commencing on September 15 or 16, one on the second Monday in January, and the third on the second Monday in June or July. The January and June (or July) examinations may be held at other centres than the University. Candidates must apply to the Principal, University of London, South Kensington, S.W., for a form of entry, on or before September 1, November 25, or April 25, which is to be returned by September 5, December 1, or May 1 for the September, January, and June examinations respectively. Candidates must be sixteen years of age (a certificate is required), and must pay a fee of 2*l.* Candidates who entered for the Matriculation at or before January, 1902, pay 1*l.* for re-examination; otherwise the same amount (2*l.*) has to be paid for every subsequent examination. The examination is conducted by means of printed papers, but the examiners are at liberty to put *vis à voce* questions at their discretion—rarely, if ever, done. Candidates will not be approved by the examiners unless they have shown a competent know-

ledge in each of the following five subjects (each paper takes three hours):

(1) ENGLISH.—Composition, *précis*-writing, paraphrase and analysis of sentences. Some of the questions will involve a knowledge of the most salient facts in English history and general geography.

(2) ELEMENTARY MATHEMATICS.—(Two papers):

Arithmetic.—Principles and processes as applied to whole numbers and vulgar and decimal fractions; metric system; approximations to a specified degree of accuracy; contracted methods of multiplication and division of decimals; ratio and proportion; percentages; averages; practical applications of arithmetic.

Algebra.—Symbolical expression of general results in arithmetic; algebraic laws and their application; factors of simple binomial or quadratic expressions; equations of the first or second degree, and problems leading thereto; square root; graphs of simple rational integral algebraic functions; arithmetic and harmonic progression; geometric progression.

Geometry.—The subjects of Euclid I-IV., with simple deductions, including easy loci and the areas of triangles and parallelograms, of which the bases and altitudes are given commensurable lengths. (Euclid's proofs will not be insisted upon.)

(3) LATIN OR ELEMENTARY MECHANICS OR ELEMENTARY PHYSICS (heat, light, and sound), or ELEMENTARY CHEMISTRY OR ELEMENTARY BOTANY (one paper).

(4 and 5) Two of the following subjects, neither of which has already been taken under (3) (one paper). If Latin be not taken one of the other subjects selected must be another language from the list, either ancient or modern: Latin, Greek, French, German, Arabic, Sanskrit, Spanish, Portuguese, Italian, Hebrew, ancient history, modern history, logic, physical and general geography, geometrical and mechanical drawing, mathematics (more advanced), elementary mechanics, elementary chemistry, elementary physics—(a) heat, light, and sound, or (b) electricity and magnetism—elementary biology—(a) botany or (b) zoology.

The regulation as to Latin (which must be taken by pharmaceutical aspirants is that the paper shall contain passages to be translated into English from Latin books not previously prescribed, together with questions on grammar and simple and easy sentences of English to be translated into Latin. [Special stress is laid on accuracy in the answers to the grammar questions, and on the correct rendering of English into Latin and Greek respectively.]

The examination takes four days, the first day two to five, the other three days ten to one and two to five. Candidates have to select their subjects and must take them in the order given in the time-table. Some of the out-of-the-way subjects require two months' notice to be given.

The pass-list is published at two o'clock on October 1 (except when that is a Sunday) and two o'clock on Saturday in the fifth week after the January and June (or July) examination, arranged in two divisions in alphabetical order. Certificates are ready a month after the pass-list is out.

The examinations are held in London and, in the case of the January and June (or July), at certain provincial centres, a list of which is published in the Regulations.

OXFORD LOCAL EXAMINATION.

The examinations (Senior and Junior) are held yearly at centres appointed by the delegacy, a list of which is given in the *Regulations*, to be obtained from the Secretary, Local Examination offices, Meiton Street, Oxford. The fee is 1*l.* and at any centre, except Oxford, there is an additional local fee. The examination comprises English, Latin, French, German, arithmetic, algebra, and Euclid, and all candidates must pass in Scripture-knowledge before a certificate is granted, unless the parents or guardians, or, in the case of candidates over twenty-one, the candidates themselves, object. The examination-papers (2*s.*) for the previous year can be had from Messrs. Parker & Co., 6 Southampton Street, W.C.

CAMBRIDGE LOCAL EXAMINATIONS.

These examinations are run on much the same lines as the Oxford Local, the Secretary of the Syndicate being Dr. J. N. Keynes, Syndicate Buildings, Cambridge. The fees and subjects are similar to those of the Oxford examination. The papers are published by Messrs. C. J. Clay & Sons, Ave Maria Lane, E.C., post free, 2*s.* 2d.

The Oxford and Cambridge Local examinations are popular with schoolmasters in England, as a test for educational progress, but are seldom taken advantage of by private students. The Senior Local is almost equal to the Matriculation

examination of the London University, and the Higher Local certificate is much valued for scholastic purposes. An examination ("Oxford and Cambridge Local") is held by a combined board of the Universities.

The most useful book for intending Preliminary candidates is Dodd's "Complete Guide to the Preliminary Examinations" (*C. & D.*), price 2s. 6d.

THE MEDICAL PRELIMINARY EXAMINATION.

Before a medical student can be registered he must satisfy the General Medical Council that he has passed a recognised Preliminary examination in the subjects of general education, and that he is sixteen years of age. The Council does not conduct the examination, but accepts certificates of approved examining bodies provided the following subjects were taken:

- (a) ENGLISH (Grammar, Paraphrasing, Composition, questions on English History and Geography).
- (b) LATIN (Grammar, Translation into English from unprescribed Latin books, Translation into Latin of a continuous English passage, and of short idiomatic English sentences).
- (c) MATHEMATICS (Arithmetic; Algebra, including easy quadratic equations; Geometry, including the subject-matter of Euclid, Books I, II, III., and simple deductions).
- (d) One of the following subjects:
 - (a) GREEK (Grammar, Translation into English from unprescribed Greek books, Translation into Greek of short idiomatic English sentences); or
 - (b) A MODERN LANGUAGE (Grammar, Translation into English from unprescribed Books, Translation of a continuous English passage, and of short idiomatic English sentences).

The following is the list of examining bodies whose examinations in general education are at present recognised by the Medical Council:

Final examination for a degree in arts or science of any University in the United Kingdom.

University of Oxford.—Junior Local examinations. Senior Local examinations. Responsions (certificate to be supplemented by others showing that the required mathematical subjects have been passed). Moderations.

University of Cambridge.—Junior Local examinations. Senior Local examinations. Higher Local examinations. Previous examination. General examination.

Oxford and Cambridge Schools' Examination Board.—Lower Certificate examinations. Higher Certificate examinations.

University of Durham.—Examination for Certificate of Proficiency (at one time). Senior Local examinations.

University of London.—Matriculation examination.

Victoria University.—Preliminary examination.

University of Birmingham.—Matriculation examination.

University of Wales.—Matriculation examination (at one time).

Universities of Scotland.—Preliminary examination of the Joint Board of Examiners of the Scottish Universities for Graduation in Medicine and Surgery (at not more than two examinations). Preliminary examination of the Joint Board of Examiners of the Scottish Universities for Graduation in Arts or Science.

University of St. Andrews.—Final examination for the diploma of LL.A.

University of Dublin.—Principal Public Entrance examinations (at one time). Examinations for the first, second, third, or fourth year in Arts.

Royal University of Ireland.—Matriculation examination.

Scottish Education Department.—Leaving Certificate examinations: passes in Lower-grade (at not more than two examinations). Leaving Certificate examinations: passes in Higher-grade or Honours.

Intermediate Education Board of Ireland.—Middle-grade examination (at one time). Senior-grade examination.

Central Welsh Board.—Senior Certificate examinations.

College of Preceptors.—Examinations for First-class Certificate (at not more than two examinations). Preliminary examination for Medical Students (at one time).

Educational Institute of Scotland.—Preliminary Medical examination (at one time).

Royal Colleges of Physicians and Surgeons in Ireland.—Preliminary examination (at one time).

Certificates of equivalent examinations are also accepted from the universities or colleges at Malta, Calcutta, Madras, Bombay, Punjab, Allahabad, Ceylon, Montreal (McGill College and Bishop's College), Quebec, Ontario, Manitoba, New Brunswick (Fredericton, Mount Allison College, and College of Physicians and Surgeons), Nova Scotia (Dalhousie College, Halifax, and Provincial Medical Board), Newfoundland, Melbourne, Sydney, Adelaide, Tasmania, Cape of Good Hope, Otago, New Zealand, Barbadoes (Codrington College).

The German Abiturienten-Examen of the Gymnasia and Rea'gymnasia; examinations entitling to the French diplomas of Bachelier ès Lettres and Bachelier ès Sciences, and other corresponding Entrance examinations to the Universities in Europe; and the Secondary Education certificate of the Egyptian Government.

The certificates are in most cases to be endorsed as fulfilling the Council's requirements and must include the required subjects as given in the table. Further information and a copy of the regulations in regard to the registration of medical and dental students can be had from the Registrar of the General Medical Council, 299 Oxford Street, W.

Pharmaceutical Education and Examination.

Great Britain.

THE Pharmacy Act, 1868, empowers the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, W.C., to examine and register all persons in Great Britain who desire to keep open shop for retailing, dispensing, or compounding poisons, or to use the title "chemist and druggist" or its equivalent. The higher title of "pharmaceutical chemist" or "pharmacist" is covered by the Pharmacy Act, 1852, and is obtained by passing the Major examination, but candidates must have previously passed the Minor. The Modified examination is a provision made by the Pharmacy Act, 1868, for those who were assistants at the time of the passing of the Act. This examination is only available for those persons who registered their names before January 1, 1870, and is now practically extinct. The Minor examination is the qualifying examination, and must be passed before the Registrar will place a name on the register. The conditions of registration are, in short:

1. Applicant must be registered as an apprentice or student of pharmacy after passing a recognised Preliminary examination; the registration-fee for this being two guineas.

2. Must have been a student of pharmacy for three years, or have been otherwise for that period practically engaged in the translation and dispensing of prescriptions.

3. Must be twenty-one years of age.

4. Must pass the Minor examination, the fee for which is ten guineas, or, in case of failure, three guineas for re-examination.

The Registrar is Mr. Richard Bremridge, 17 Bloomsbury Square, W.C., from whom the official particulars of the examinations can be had. Candidates for registration as students should allow plenty of time for the purpose, as circumlocution methods are not unknown at Bloomsbury Square. In addition, it may happen that the Preliminary examination is one the Boards of Examiners are unacquainted with, and evidence may have to be submitted that the examination is up to the standard required by the regulations. The fee has to be sent with the application for registration, and we advise that this be done at least three months before entering for the Minor. The second condition noted above does not require the applicant to have served an apprenticeship, but pupilage in some form

is the accepted method of fulfilling this condition. A form is obtainable from the Registrar upon which this declaration is made. A birth-certificate is needed to prove the candidate's age, and this is obtainable from Somerset House on giving name and date and paying 3s. 7d., made up as follows: 2s. 6d. for certificate, 1s. for search, and 1d. for stamp. Inquiries by post from residents in the metropolis will not be considered; attendance in person or by agent is necessary. Certificates are also obtainable at the above rates from the Superintendent Registrar of the district in which the birth occurred. Examinations are held in London and Edinburgh four times a year, there being separate Boards of Examiners for England and Wales and for Scotland. Candidates must give notice and pay the fee to the Registrar on or before the 15th day of March, June, September, or December for the examinations which are held in the beginning of the following months. For this an application-form is supplied, and again plenty of time should be allowed in case all the details are not in order. At present there is no curriculum compulsory, although as a matter of fact the great majority of candidates take a course at a school of pharmacy. The Council of the Pharmaceutical Society recommends that all candidates before presenting themselves for examination should receive a systematic course of instruction occupying a period of not less than six months, and that such a period of study should include at least sixty lectures in chemistry, eighteen hours' work per week at practical chemistry, forty-five lectures and demonstrations in botany, and twenty-five lectures and demonstrations in materia medica.

The following is a reprint of the syllabus which the Registrar supplies on application:

MINOR EXAMINATION.

Botany.

The candidate is required to possess a practical knowledge of—
(a) CLASSIFICATION. The main divisions of the vegetable kingdom and their most important characteristics: Thallophyta, Bryophyta, Pteridophyta, Phanerogamia. The following Sub-classes and Natural Orders of the Angiosperms: Thalamiflorae, Calyciflorae, Corolliflorae, Monochlamydeae, Petaloideae, Spadiceiflorae, and Glumiflorae; Ranunculaceae, Cruciferae, Rosaceae, Leguminosae, Umbelliferae, Compositae, Solanaceae, Liliaceae. The description of flowering plants in technical language. The candidate is also required to recognise any of the plants in the following list:—

List of Plants for Recognition.

Aconitum Napellus, *Papaver Rhoeas*, *P. somniferum*, *Brassica alba*, *B. nigra*, *Cochlearia Armoracia*, *Althaea officinalis*, *Ruta graveolens*, *Cytisus Scoparius*, *Rosa canina*, *Prunus laurocerasus*, *Bryonia dioica*, *Conium maculatum*, *Foeniculum capillare*, (*Eranthe crocata*, *Sanibucus nigra*, *Valeriana officinalis*, *Anthemis nobilis*, *Matricaria Chamomilla*, *Taraxacum officinale*, *Menyanthes trifoliata*, *Atropa Belladonna*, *Datura Stramonium*, *Hyoscyamus niger*, *Solanum Dulcamara*, *Digitalis purpurea*, *Lavandula vera*, *Mentha piperita*, *M. viridis*, *M. Pulegium*, *Rosmarinus officinalis*, *Daphne Laureola*, *D. Mezereum*, *Quercus Robur*, *Ulmus campestris*, *Salix alba*, *Colchicum autumnale*, *Avena sativa*, *Hordeum distichon*, *Triticum vulgare*, *Pinus sylvestris*, *Juniperus communis*, *J. Sabina*, *Taxus baccata*, *Aspidium Filix-mas*.

(b) MORPHOLOGY, INCLUDING ANATOMY. The external form of plants: Thallus, stem, root, leaves, inflorescence, flower, fruit. The distinguishing features and common modifications of these structures. Principles of branching and different kinds of branch systems. Phyllotaxis, including veneration. The different kinds of buds and their arrangement on the stem. A general acquaintance with the elements of plant-anatomy; the vegetable cell, tissues—*e.g.*, merismatic, epidermal, fundamental and vascular. The characteristic anatomical features of roots, stems, and leaves of flowering plants and ferns. The candidate is expected to recognise by means of the microscope, and describe sections illustrating the above plant-structures. The method of increase in thickness of stems and roots, and the characters of primary and secondary tissues. The characters of the flowers. The methods of pollination; self- and cross-fertilisation. The formation of the seed and germination.

(c) PHYSIOLOGY. The elementary facts in connection with the physiology of plants, including the nature and source of the food of plants, and the manner in which the raw materials are elaborated. Chlorophyll, its manner of occurrence in the plant; its functions and the conditions under which it discharges them. Reserve materials, their nature, mode of deposition, and the manner in which they are utilised by the plant. The manner in which plants grow, and the conditions necessary for the growth of a plant. The manner in which plants respond to external

stimuli—*e.g.*, light, gravity, &c. Sexual and asexual reproduction.

Chemistry and Physics.

The candidate is expected to possess an elementary knowledge of the following subjects:—

(a) The law of the conservation of energy; the law of gravitation; the balance; specific gravity; atmospheric pressure; pressure of aqueous vapour; the barometer, air-pump, and syphon; the law of Boyle; temperature; thermometers; the law of Charles; the law of gaseous diffusion; V. Meyer's method for determining vapour-densities.

(b) The chief characteristics of chemical action, the distinction of elements and compounds; the laws of chemical combination by weight and volume; the hypothesis of Avogadro; atomic weight and molecular weight; chemical formulae and nomenclature; valency; the distinction between metals and non-metals.

(c) The general characters of the non-metals; the chief methods of preparation and the typical reactions of the following non-metallic elements and compounds:—Hydrogen, oxygen, ozone, water, hydrogen peroxide; chlorine, bromine and iodine, and their compounds with hydrogen and oxygen; fluorine, hydrofluoric acid; nitrogen, ammonia, the oxides of nitrogen, nitrous acid, nitric acid; sulphur, hydrogen sulphide, sulphurous and sulphuric anhydrides and acids, thiosulphuric acid; phosphorus, phosphine, the oxides and oxy-acids of phosphorus, the chlorides of phosphorus; silicon, silica, fluoride of silicon, silicofluoric acid; boron, boric acid. The usual impurities in such of the above-named substances as are included in the British Pharmacopoeia.

(d) The general characters and classification of the metals, and the general methods of forming oxides and salts; the sources, the usual methods of extracting, and the chief properties of, the undermentioned metals, also the modes of preparation, properties, adulterations, and contaminations of their principal compounds: Potassium, sodium, ammonium, lithium, barium, strontium, calcium, magnesium, zinc, aluminium, iron, chromium, manganese, nickel, cobalt, arsenium, antimony, tin, copper, bismuth, lead, silver, mercury, gold and platinum.

(e) Carbon, its oxides, cyanogen, hydrocyanic acid, cyanides, ferrocyanides and ferricyanides, oxalic acid. The chief methods of preparing methane, ethane, ethylene, acetylene, methyl and ethyl alcohols, formic and acetic aldehydes and acids, ethyl acetate, acetamide, olein, glycerol, benzene, phenol, nitro-benzene, aniline, benzoic acid, salicylic acid, hydrate of chloral, chloroform, iodoform, ether; the principal properties, reactions, and mutual relations of these compounds. The candidate will also be expected to possess a general knowledge of the methods of estimating carbon, hydrogen, oxygen, and nitrogen in organic compounds, and of obtaining molecular formulae.

Note.—The candidate is expected to solve simple problems relating to the weight and volume, under different conditions of temperature and pressure, of elements and compounds concerned in chemical reactions.

Chemistry.—Practical Examination.

The candidate is required to determine the sp. gr. of liquids and solids, and to be familiar with the general construction and use of the thermometer and barometer; to recognise by chemical tests the more important non-metallic elements and compounds, as well as the metals and salts indicated in the foregoing list; to detect the chief impurities in those that are included in the British Pharmacopoeia; to recognise by their physical properties those which possess well-defined characteristics. To analyse a mixture containing not more than two metals and two acid radicals; to identify by chemical tests the following organic compounds: hydrocyanic acid, cyanides, ferrocyanides, ferricyanides, oxalates, acetates, tartrates, citrates, salicylates, starch, cane-sugar, grape-sugar, salicin, quinine, morphine, strychnine, and their salts; and to detect the impurities in such as are included in the British Pharmacopoeia; to perform those volumetric determinations which are described in the British Pharmacopoeia. To understand the principles of volumetric analysis, and to prepare, standardise, and use volumetric solutions; to be familiar with the construction and use of the balance, and to have a practical knowledge of the Imperial and metric systems of weights and measures; to quantitatively determine the total alkaloids in cinchona-bark and its official preparations, in the liquid extract of belladonna and its preparations, and in the liquid extract of ipecacuanha; also the strychnine in the extract, liquid extract, and tincture of nux vomica; the morphine in opium and its extract, liquid extract, and tincture; and the resin in tincture of jalap; to have a practical acquaintance with the methods of preparing the more important inorganic substances including the non-metals and their compounds, and such metallic compounds as are included in the British Pharmacopoeia, and also the following organic compounds—ether, chloroform, amyl nitrite, ethyl acetate, and hydrocyanic acid—so that he may be able to explain to the examiner the operations involved in their preparation, and, if called upon, to perform the operations or certain stages of them himself.

Materia Medica.

The candidate is required to recognise specimens of any crude drugs mentioned in the British Pharmacopœia or in the annexed list, as well as their principal commercial varieties; to be acquainted with their botanical (or zoological), geographical, and commercial sources, the natural orders to which they belong, as well as the modes of collection and preparation for the market; to indicate the morphological nature of such as are organised, and the mode of formation of such as are unorganised; to correctly describe them, and to point out diagnostic characters either chemical or physical, the latter as far as they can be ascertained by the use of a lens. To name the chief active constituents of official drugs, to know the proportion present in good samples of the more important of them, and to possess a practical knowledge of any pharmacopœial tests or processes of assay applied to crude drugs or their official products.

Roots.—*Althæa officinalis*, *Inula Helenium*, *Alkanna tinctoria*, *Bryonia dioica*.

Rhizomes, &c.—*Helleborus niger*, *Sanguinaria canadensis*, *Iris florentina*, *Veratrum album*, *Acorus Calamus*, *Agropyron* (*Triticum*) *repens*, *Veratrum viride*.

Barks.—*Berberis vulgaris*, *Erythrophloeum guineense*, *Ulmus campestris*, *U. fulva*, *Cinnamomum Cassia*, *Coto*, *Nectandra Rodiei*, *Canella alba*, *Cinchona Calisaya*, *Cinchona lancifolia*, *Pinus Larix*, *Quercus Robur*, *Rhamnus Frangula*.

Leaves.—*Aconitum Napellus*, *Piper angustifolium*, *Nicotiana Tabacum*.

Herbs, &c.—*Grindelia squarrosa et robusta*, *Marrubium vulgare*, *Solanum Dulcamara*, *Euphorbia pulifera*, *Convallaria majalis*, *Lactuca virosa*, *Ruta graveolens*, *Juniperus Sabina*.

Flowers.—*Calendula officinalis*, *Pyrethrum cineræfolium*, &c., *Arnica montana*, *Rosa centifolia*.

Fruits.—*Punica Granatum*, *Cuminum Cyminum*, *Laurus nobilis*, *Piper longum*, *Vanilla planifolia*, *Ægle Marmelos*.

Seeds.—*Theobroma Cacao*, *Paulinia sorbilis* (*Guarana*), *Trigonella Fœnum-græcum*, *Dipteryx odorata*, *Pyrus Cydonia*, *Strychnos anara*, *Hyoscyamus niger*, *Anommm Melegueta*, *Areca Catechu*, *Hordeum distichon*.

Hairs or Glands.—*Mucuna pruriens*, *Mallotus philippinensis*.

Juices, &c.—*Black Catechu*, *Lactucarium*, *Cape Aloes*, *Natal Aloes*, *Guttapercha*, *Manna*.

Gum-Resins.—*Olibanum*, *Euphorbium*.

Resins.—*Sandarac*, *Dragon's Blood*, *Shellac*, *Mastiche*, *Elemi*.

Cryptogamic Substances.—*Lycopodium*, *Fucus vesiculosus*, *Chondrus crispus*, *Cetraria islandica*.

Animal Substances.—*Mylabris Cichorii*, *Mylabris phalerata*, *Castoreum*.

Pharmacy.

The candidate is required to possess a general knowledge of the following branches:—

(a) Operations requiring the use of heat. Evaporation, with particular reference to the preparation of extracts and inspissated juices; special characters and modes of preparing the various classes of extracts; influence of surface, temperature, and pressure upon the rate of evaporation; water, steam, and sand baths; distillation, ordinary, fractional, and destructive, distinctive characters and objects of each; official preparations illustrating the various kinds of distillation, apparatus employed, the retort and receiver, still and worm, Liebig's condenser, principles on which they are constructed and used. Sublimation: its objects and applications in pharmacy; official products of sublimation, calcination, and fusion. Desiccation; temperature best suited for drying particular drugs, loss in drying vegetable drugs, forms of drying-ovens, principles on which they are constructed and used.

(b) Disintegration of solid substances; cutting, bruising, and pulverisation; apparatus employed, principles indicating which is to be adopted in particular instances; methods for controlling the degree of comminution, sieves and sifting, trituration, levigation, elutriation, granulation, including methods for producing certain chemicals as fine powders, small crystals, scales, &c. Solution: its nature, solvent power of various menstrua, influences of (a) temperature; (b) state of division of the substance to be dissolved; (c) time; (d) position of the substance in the menstruum; lixiviation, infusion, digestion, and decoction; maceration, percolation, and displacement, principles on which the successful performance of these processes depends; form and materials for percolators and other vessels employed. Filtration, objects and methods, filtering media, means of expediting filtration; dialysis: its application in pharmacy, construction and use of the dialyser. Expression: methods of obtaining the juices from plants; recovery of the residual liquids from tincture-mares, &c.; screw, hydraulic, and other presses. The principles involved in the dispensing of medicines, particularly with reference to the best excipients and methods for forming pill-masses, the preparation and nature of emulsions, the most suitable emulsifying agents, and the best means of suspending insoluble substances in liquids.

The candidate is also required to show a general knowledge of the processes, and understand the principles of the processes, by which the official preparations belonging to the following classes

are made: Collodions, confections, decoctions, dilute acids, extracts (solid and liquid), glycerins, infusions, juices, liniments, lotions, mixtures, ointments, pill-masses, plasters, powders (simple and compound), solutions, spirits, suppositories, syrups, tinctures, vinegars, waters, and wines. A knowledge of the proportion of active ingredient or crude material in official preparations containing aconite, antimony, arsenic, belladonna, Calabar bean, cantharides, chloral hydrate, chloroform, caustic potash and soda, colchicum, digitalis, claterinum, ergot, iodine, iodoform, ipecacuanha, lead, mercury, nux vomica, opium, phosphorus, scammony, stramonium, squill, alkaloids, and alkaloidal salts.

The candidate is required:—

(a) To enumerate the poisons contained in Schedule A of the Pharmacy Act, 1868, and those since added thereto, in pursuance of the provision contained in section 2 of that Act, viz.:—

Poisons within Part I. of the Schedule.

Poisons within Part II. of the Schedule.

(b) To describe minutely the conditions required upon the sale by retail of poisons, both in Part I. and Part II. of Schedule A; and to write the proper entry required, according to Schedule F of the Act, for the sale of a poison coming within Part I. of Schedule A.

(c) To state the conditions imposed on the sale of scheduled poisons by wholesale and for export; and upon the sale of a scheduled poison when forming an ingredient in a medicine dispensed.

The candidate is also expected to possess a knowledge of the conditions imposed on the sale of arsenic by the Arsenic Act.

Practical Pharmacy and Dispensing.

The candidate is required to conduct such operations of the British Pharmacopœia, or such parts of them as may be practicable, involved in the processes for preparing collodions, confections, decoctions, dilute acid, extracts (solid and liquid), glycerins, infusions, juices, liniments, lotions, mixtures, ointments, pill-masses, plasters, powders (simple and compound), solutions, spirits, suppositories, syrups, tinctures, vinegars, waters, and wines.

To weigh, measure, and compound medicines; to write the directions in concise language in a neat and distinct hand; to finish and properly direct each package. [In awarding marks in this subject, the time taken by the candidate in doing the work is taken into account.]

Prescriptions.

The candidate is required to read, without abbreviation, auto-graph prescriptions; translate them into English; understand the grammatical construction of the Latin; and render a literal as well as an appropriate translation of the directions for use. To detect errors, discover unusual doses, and have a general knowledge of posology. To calculate percentages and other quantities occurring in prescriptions; also to render in good Latin ordinary prescriptions written in English.

Candidates must not take into the examination-rooms or laboratories any books or any notes or memoranda, whether written or in print.

PREPARING FOR THE EXAMINATION.

"Begin young" is about the best advice that can be given to those who wish to study for the Minor examination. Apprentices should on no account drop the habit of study acquired at school—it is irksome to have to acquire it again later in life. Cultivate the habit of observation and inquiry; the working-day in a pharmacy is crowded with food for thought.

The duty of an apprentice-master is to guide his pupil in his mastery of the art of pharmacy, and he will answer the inquiries, or refer to some standard work from which the information can be obtained. The British Pharmacopœia and Squire's "Companion" are found in every pharmacy, and are really the keys to pharmacy. As the apprenticeship advances, any of the following books may be obtained with the advantage that at a later stage, when studying at a school of pharmacy, familiarity with standard text-books leads to a lightening of labour. We may add, lest the list appear to be too long, that it is not intended that the student shall obtain all the books mentioned; only one or two under each heading are necessary.

Botany.

Bower's "Practical Botany for Beginners." (Macmillan.) 3s. 6d.

Green's "Manual of Botany." (Churchill.) Vol. 1, 7s. 6d.; vol. 2, 10s. 6d.

Lowson's "Botany." (Clive.) 6s. 6d.

Scott's "Introduction to Structural Botany." (Black.) 7s. 6d.

Vine's "Smaller Text-book of Botany." (Sonnenchein.) 3s. 6d.

Chemistry.

- Atfield's "Chemistry." (Gurney & Jackson.) 15s.
 Bernthsen's "Organic Chemistry." (Blackie.) 7s. 6d.
 Meyer's "Outlines of Theoretical Chemistry." (Longmans.) 9s.
 Newth's "Organic Chemistry." (Longmans.) 6s. 6d.
 Perkin and Kipping's "Organic Chemistry." (Chambers.) 6s. 6d.
 Remsen's "Organic Chemistry." (Macmillan.)

Analytical Chemistry.

- Clowes and Coleman's "Elementary Practical Chemistry and Chemical Analysis." (Churchill.) 3s. 6d.
 Muter's "Analytical Chemistry." (Baillière.) 6s. 6d.
 Newth's "Practical Chemistry." (Longmans.) 2s. 6d.
 Perkins's "Qualitative Chemical Analysis." (Longmans.) 3s. 6d.
 Proctor's "Pharmaceutical Testing." (C. & D. office.) 2s. 6d.

Physics.

- Draper's "Heat" (Blackie.) 4s. 6d.
 Everett's "Physics." (Blackie.) 3s. 6d.
 Ganot's "Physics." (Macmillan.) 15s.
 Glazebrook's "Heat and Light." (Cambridge Press.) 5s.
 Loney's "Mechanics and Hydrostatics for Beginners." (Cambridge Press.) 3s. 6d.
 Poyser's "Advanced Magnetism and Electricity." (Longmans.) 4s. 6d.
 Stewart's "Light." (Clive.) 3s. 6d.
 Thompson's "Electricity and Magnetism." (Macmillan.) 4s. 6d.

Calculations.

- Dohbin's "Arithmetical Exercises in Chemistry." (Thin.) 1s.
 Whiteley's "Chemical Calculations." (Longmans.) 2s.

Materia Medica.

- Flückiger and Hanbury's "Pharmacographia." (Macmillan.) 21s.
 Greenish's "Introduction to Materia Medica." (Churchill.) 15s.
 Maisch's "Materia Medica." (Kimpton.) 10s. 6d.
 Murrell's "Aids to Materia Medica." (Baillière.) 3 vols. 2s. 6d. each.
 Southall's "Organic Materia Medica." (Churchill.) 4s. 6d.

Microscope.

- Greenish's "Microscopic Examination of Food and Drugs." (Churchill.) 10s. 6d.
 Hogg's "Microscope." (Routledge.) 10s. 6d.
 Squire's "Methods and Formulæ." (Churchill.) 3s. 6d.

Pharmacy.

- British Pharmacopoeia, 1901. (Spottiswoode.) 10s. 6d.
 Coblentz's "Handbook of Pharmacy." (Blakiston.) 18s.
 Lucas's "Practical Pharmacy." (Churchill.) 12s. 6d.
 Squire's "Companion to the British Pharmacopoeia." (Churchill.) 12s. 6d.
 White and Humphrey's "Pharmacopodia." (Kimpton.) 14s.

Poison Laws.

- CHEMISTS' AND DRUGGISTS' DIARY. 3s. 6d.

Dispensing.

- "Art of Dispensing." (C. & D. Office.) 5s. 6d.

Prescription-reading.

- Ince's "Latin Grammar of Pharmacy." (Baillière.) 5s.
 Pereira's "Selecta à Prescriptis." (Churchill.) 5s.
 Watson-Will's "Prescription reading" (Metropolitan College.) 12s. 6d.

The most important subject, and the one to which the student should early direct his attention, is chemistry. Evening classes are held in this subject in every town in the Kingdom, and it cannot truthfully be said that any pharmaceutical student is out of reach of some of the courses provided by the Board of Education, South Kensington. There is no excuse for not practising analytical chemistry, as it can readily be practised in the back shop, and in this connection much valuable instruction can be extracted by following the exercises given in the Students' Corner of this journal.

It is not necessary for us to tell what the examination is actually like, as this has been frequently done in graphic fashion in contributions to THE CHEMIST AND DRUGGIST. Recent accounts will be found in the *C. & D.* (Major), July 19,

1902, page 91, and April 18, 1903, page 640 (where an abstracts of the dispensing and chemistry papers are also given).

THE MAJOR EXAMINATION

is the honours examination in pharmacy. It entitles those who pass to call themselves "pharmacists," "pharmaceuticalists," or "pharmaceutical chemists." It is not compulsory, and the candidate must have previously passed the Minor examination. At the end of last year there were 15,526 names on the register, and of these 2170 were pharmaceutical chemists, forty-five being the number of persons who passed the Major in 1902. This shows that but a small proportion of chemists think it worth while to take the higher examination; but any pharmaceutical chemist will tell an inquirer that the additional educational advantages obtained by studying for the examination are well worth the extra trouble. The examination is a more searching one than the Minor, but only embraces chemistry, physics, botany, and materia medica. It is written and practical, and lasts three days, being held in London and Edinburgh in the same months as the Minor. It is under consideration to allow candidates to pass in two subjects of the examination, chemistry or materia medica being one of the two. The fee for the examination is three guineas.

The following is a synopsis of the subjects required for the Major examination:

BOTANY.—Candidates should have a thorough knowledge of morphology, physiology, and histology, as well as classification. They are required to make and mount microscopic preparations illustrating vegetable structure, and to apply micro-chemical tests for plant-tissues.

CHEMISTRY AND PHYSICS.—Candidates may be taken more fully in the Minor subjects, and are expected to have a good knowledge of the constitution of matter, heat, light, magnetism, electricity, chemical theory, and the classification, characteristics, and constitution of the carbon compounds, particularly cyanogen derivatives, hydrocarbons, and paraffin and benzene derivatives.

PRACTICAL WORK in this subject comprises the analysis of mixtures of three metallic salts; estimation of nitrogen in organic compounds; determination of melting and boiling points; gas-analysis by nitrometer; preparation of certain organic substances; recognition of pharmacopoeial chemicals; and generally the application of all B.P. chemical tests and assay processes, and the separation of alkaloids and glucosides; also the detection of methyl alcohol in galenical preparations.

MATERIA MEDICA.—Candidates must know how to estimate the value of important drugs, and to distinguish commercial varieties, and separate official active principles. Also to have a general acquaintance with the actual constituents of all important drugs, discover adulterations, examine drugs microscopically, and so on.

Full details are given in the official syllabus, obtainable from the Secretary at Bloomsbury Square.

Ireland.

Under the Pharmacy Act (Ireland), 1875 (amended by the Act of 1890) the control of examinations for the practice of pharmacy is in the hands of the Pharmaceutical Society of Ireland, whose headquarters are at 67 Lower Mount Street, Dublin. There are two grades of qualification—viz., (1) pharmaceutical chemists, who may sell poisons and compound prescriptions; and (2) registered druggists, who may sell and mix poisons, but must not compound prescriptions. Those of the latter class who were in business before the passing of the Act are called "chemists and druggists." The following are the regulations for the title

PHARMACEUTICAL CHEMIST.

(1) Candidates must pass a Preliminary examination as conducted by the Society, or its equivalent.

(2) Candidates must serve four years as apprentice or assistant with a pharmaceutical chemist in Ireland or Great Britain, or chemist and druggist (Great Britain), or apothecary, or four years with an Irish druggist and two years with a pharmaceutical chemist. (N.B.—Service must be with an individual or individuals, not a limited company.)

(3) Candidates must produce evidence of instruction in botany, practical chemistry, and materia medica at an approved school or schools.

(4) They must be twenty-one years of age, and

(5) Pass the Licence examination.

The Irish qualification does not entitle its holder to practise in Great Britain, nor is the British qualification recognised in Ireland.

PRELIMINARY EXAMINATION.

The Irish Society maintain the control of this examination, and conduct it on the first Tuesday and Wednesday of January, April, July, and October, at the Society's House in Dublin. It includes Latin, English, arithmetic, algebra, geometry, elementary theoretical chemistry, and also one of the following: Elementary physics and mechanics, the rudiments of botany, French, German, or other modern language. A competent knowledge of grammar is also required. The fee is 2*l.* 2*s.*, and must be lodged in the Bank of Ireland and a receipt forwarded to the Secretary (Mr. Arthur T. Ferrall, 67 Lower Mount Street, Dublin), together with an application to be examined, at least fourteen clear days before the date of the examination. A rejected candidate may present himself again after six months on payment of a further fee of 10*s.* 6*d.* The following is the official syllabus of the examination:

LATIN.—To translate into English and parse sentences from a Latin author:—Cæsar's "Commentaries," First Book, or Virgil's "Æneid," First Book. To translate an easy [English] sentence into Latin. [Minimum pass, 20 per cent.]

ENGLISH.—English grammar, including orthography and parsing. To write on a subject selected by the examiner; and to write from dictation. [Minimum pass, 50 per cent.]

ARITHMETIC.—The first four rules, simple proportion, vulgar fractions, and decimals. To describe the British weights and measures and the metric system. [Minimum pass, 50 per cent.]

ALGEBRA.—As far as simple equations, inclusive. [Minimum pass, 20 per cent.]

GEOMETRY.—Including the first book of Euclid. [Minimum pass, 20 per cent.]

ELEMENTARY THEORETICAL CHEMISTRY.—*Chemical Action.*—Illustrations and examples. Simple and compound substances. Atoms and molecules. Chemical symbols and nomenclature; formulae and equations. General nature of acids, bases, and salts. *Combustion.*—Structure and properties of flame. *Water.*—Proofs of composition; methods of purification. *The Air.*—Its constitution; reasons for considering it a mixture and not a compound. The chief physical and chemical characters, with methods of preparation, of the following elements and compounds: Hydrogen, oxygen (and ozone), nitrogen, carbon, chlorine, sulphur, nitrous oxide, nitric oxide, nitric acid, ammonia, carbon dioxide, carbon monoxide, marsh gas, olefiant gas, hydrochloric acid, sulphur dioxide, sulphurous acid, sulphuric acid, sulphuretted hydrogen. [Minimum pass, 20 per cent.]

The candidate must pass in one, at least, of the following optional subjects [the one selected has to be stated at the time of application]:—

ELEMENTARY PHYSICS AND MECHANICS.—Sound, light, and heat, as given in Ganot's "Elementary Course of Natural Philosophy"; mechanics of solids and fluids, comprising the elements of statics, dynamics, and hydrostatics.

THE RUDIMENTS OF BOTANY.—Oliver's "Lessons in Elementary Botany," Part I.

FRENCH, GERMAN, or any modern language.

In awarding marks, spelling and the quality of handwriting are taken into account. An aggregate of 40 per cent. of marks is necessary to pass. Certificates of having passed any of the examinations accepted by the General Medical Council and the Pharmaceutical Society of Great Britain are accepted in lieu of the above, provided the examination has been passed at least one year before the candidate presents himself for the pharmaceutical licence and the fee of 2*l.* 2*s.* be paid.

PHARMACEUTICAL LICENCE EXAMINATION.

Candidates for this examination must be twenty-one years of age (to be proved by certificate), and have passed the Preliminary examination or its equivalent at least one year previously. They must also produce a certificate showing that they have had four years' shop-experience under a properly qualified master. The examination is held on the second Wednesday of January, April, July, and October, at 11 A.M. Fourteen clear days' notice has to be given to the Registrar, together with a receipt for the fee (5*l.* 5*s.*), which must be previously lodged in the Bank of Ireland. At the same time the certificates regarding age, Preliminary examination, and shop-experience must be forwarded, together with a certificate proving attendance at a course of practical chemistry of not less than three months, and actual work at the bench of 100 hours (except in the case of certificates issued before July 1, 1888), at any of the following institu-

tions, also a course of botany and materia medica at one of those marked with an asterisk:

*Pharmaceutical Society of Ireland's School.

*Pharmaceutical Society of Great Britain's School.

Cecilia Street School of Medicine, Dublin.

City of Dublin Technical Schools.

City School of Chemistry and Pharmacy (Limited), Chancery Lane, London, W.C.

Government School of Science, South Kensington.

Queen's College, Belfast.

*Queen's Colleges, Cork and Galway.

Royal College of Science for Ireland, Dublin.

Royal College of Surgeons in Ireland, Dublin.

*School of Physic, Trinity College, Dublin.

Anderson's College Medical School, Glasgow.

*Royal Academical Institution, Belfast.

*Municipal Technical Institute, Belfast.

Crawford Municipal Technical Institute, Cork (Botany only).

The fee for subsequent examination is 1*l.* 11*s.* 6*d.* It is advisable to communicate with the Registrar (67 Lower Mount Street, Dublin) as long as possible beforehand, seeing that so many conditions have to be complied with in giving notice. The examination is written, practical, and oral, and the subjects are as follows:

BOTANY.—To recognise the principal indigenous plants used in medicine, to refer them to their natural orders, and to give the definitions and the distinctive characters of their several parts.

MATERIA MEDICA.—To recognise specimens of the drugs of the Pharmacopœia; to describe their characters and active principles, name the sources from which they are obtained, and the official preparations into which they enter; and to detect adulterations.

GENERAL AND PHARMACEUTICAL CHEMISTRY.—The elementary laws of chemistry and physics, including chemical equations. To recognise the chemical substances of the Pharmacopœia; to describe the processes by which they are obtained; qualitative analysis (including the tests of the Pharmacopœia) and volumetric analysis; and to submit to a practical examination in these subjects.

PRACTICAL PHARMACY.—To translate Latin prescriptions; to detect dangerous doses; to compound and dispense correctly. To explain the processes of making the non-chemical preparations of the Pharmacopœia, and to recognise them. To submit to an examination in the Sale of Poisons (Ireland) Act.

The minimum pass percentages are: Pharmacy, 50 per cent.; botany, 40 per cent.; materia medica, 40 per cent.; chemistry, 40 per cent.; but the candidate must make an aggregate of 55 per cent. The Council awards a gold medal to the best candidate of the year at the examination, provided he makes a total of not less than 240 marks out of the 300, and of 65 in each of the subjects; and a silver medal to the second best candidate, provided he makes a total of not less than 230 marks out of the 300, and of 60 in each of the three subjects.

EXAMINATION FOR REGISTERED DRUGGISTS.

The candidate for this title is examined with respect to his knowledge of English orthography and composition, arithmetic, and the weights and measures of the British Pharmacopœia, the appearance and properties of the various drugs and chemicals in general use, and the Irish Poisons Act. He must have served four years as an apprentice or assistant to a registered druggist, or pharmaceutical chemist, or chemist and druggist, or apothecary, and when applying (fourteen days previous to the examination) he must enclose declarations to this effect, together with a receipt for the fee (2*l.* 2*s.*) paid into the Bank of Ireland. The examination is held in Dublin on the second Tuesday of January, April, July, and October, and at any place for which twelve candidates make application. (The examination is sometimes held in Belfast.) On passing, a further fee of 2*l.* 2*s.* is paid for registration.

ASSISTANTS' CERTIFICATES.

Examinations for these are held in Dublin on the second Mondays of January, April, July, and October. Fourteen days' notice must be given to the Registrar, together with the Bank of Ireland's receipt for the fee (1*l.* 1*s.*). The candidate must have passed the Preliminary examination and have been engaged in practical pharmacy for four years, which must be proved, as in the Licence examination. The subjects of examination are the reading and translation of autograph prescriptions and detection of unusual doses;

practical dispensing; materia medica as far as recognition of specimens and knowledge of quality and purity are concerned; pharmacy as regards recognition and knowledge of proportions of active ingredients; and the Sale of Poisons (Ireland) Act.

The remarks on preparing for examination on page 321 refer also to the qualifying examinations of the Pharmaceutical Society of Ireland.

Channel Islands and Isle of Man.

The Pharmacy Act, 1863 extends to Orkney and Shetland, but not to the Channel Islands and Isle of Man, which have power to make their own laws.

GUERNSEY requires production of British or French certificates to secure registration in the island.

JERSEY restricts the sale and dispensing of poisons to registered chemists and druggists or pharmaceutical chemists of Great Britain, or pharmaceutical chemists of Ireland, or holders of the pharmacian diploma of France.

THE ISLE OF MAN accepts the British or Irish qualification. Those who were assistants in the island for nine years prior to 1899 are registered on production of the Apothecaries' Society's Assistants' certificate.

British Colonies.

The Minor certificate of Great Britain and the Irish licence are recognised in every part of the British Dominion, New South Wales (previously the exception) having come into line this year. Canada has its own pharmacy law with a Preliminary and qualifying examination, a curriculum being required at Ontario and at Quebec. The home-qualifications are, however, recognised, but the registration-fees must be paid. In British Guiana and the West Indies, also Gibraltar, the same certificates suffice for registration. Malta has a pharmacy law with an examination, but anyone on the British or Irish register is licensed there on payment of 1*l*. The South African Colonies have pharmacy laws and examinations on similar lines to those at home, but British and Irish certificates are accepted. The Australian Colonies and New Zealand have Pharmacy Acts, but all accept the British and Irish qualification. India, Ceylon, and Straits Settlements have no Pharmacy Acts, but local licensing laws for the sale of poisons, for which the British and Irish licences hold good. Persons emigrating should, before leaving this country, assure themselves that their names are on the register, and should take their certificates with them.

APOTHECARIES' ASSISTANTS.

Under the Apothecaries Act, 1815, persons who act as assistants to licentiates of the Society of Apothecaries by compounding and dispensing medicines must obtain a certificate of qualification from the Society. This certificate is recognised by the Local Government Board as a qualification for Poor-law dispenserships in England and Wales. Some Minor students, especially in London, use the examination as a sort of test of their knowledge before attempting the Minor, and lady dispensers have found it an easier and quicker way of qualifying than the Minor. "*The certificate does not convey the right to assume any title on the part of the person to whom it is granted,*" nor, we may add, does it confer the right to keep open shop for the sale of poisons. The examination is held at the Apothecaries' Hall, Blackfriars, London, E.C., on the fourth Wednesday and following days of January, April, July, and October. The examination consists of two parts—the practical and the oral. The former, which commences at 10 A.M., comprises the compounding and dispensing of medicines, and the latter, commencing at 2 P.M., chemistry, materia medica and pharmacy, and the translation of prescriptions. A candidate will be credited with any subject in which he may satisfy the examiners. The syllabus is as follows:

CHEMISTRY.

The general principles of chemistry. Meaning of chemical symbols and formulae. Distinctive properties of acids, bases, and salts. The preparation and properties of the elements: oxygen, hydrogen, nitrogen, chlorine, bromine, iodine, carbon, sulphur, phosphorus, arsenic, and their more important compounds with

oxygen and with hydrogen. Hydrochloric, nitric, and sulphuric acids, and their action upon the common metals, metallic oxides, and carbonates. The chemical composition of water and air, The preparation, properties, and tests of the following:

Ammonium carbonate, chloride, and nitrate.

Sodium hydrate, borate, carbonate, bicarbonate, chloride, nitrate, sulphate, and sulphite.

Potassium hydrate, carbonate, bicarbonate, bichromate, bromide, chlorate, cyanide, iodide, nitrate, and permanganate.

Calcium oxide, hydrate, chloride, carbonate, and sulphate.

Magnesium oxide, carbonate, and sulphate.

Alum.

Zinc oxide, carbonate, chloride, and sulphate.

Iron reduced, peroxide, protosulphate, persulphate, perchloride.

Lead metal, oxides, acetate, subacetate, and carbonate.

Silver metal, oxide, and nitrate.

Copper metal, nitrate, and sulphate.

Bismuth metal, oxide, nitrate, and carbonate.

Antimony oxide and chloride, and tartar emetic.

Mercury oxides and iodides, calomel and corrosive sublimate.

Alcohol, ether, acetic ether, chloral hydrate, chloroform, iodoform, glycerin, quinine, and strychnine.

Hydrocyanic, acetic, tartaric, and citric acids, and their common salts.

Candidates will be expected to have performed or to have witnessed experiments illustrating the principal properties of the substances mentioned in the syllabus.

MATERIA MEDICA AND PHARMACY.

Candidates will be required to show a knowledge of the chemical and physical characters, the composition, and doses of the articles and preparations included in the British Pharmacopoeia, 1898, and to recognise the following substances:

Acidum arseniosum, acidum benzoicum, acidum carbolicum, acidum gallicum, acidum hydrocyanicum dilutum, acidum salicylicum, acidum tannicum, alumen, ammonii carbonas, ammonii chloridum, antimonium tartaratum, borax, calx chlorinata, carbo ligni, cupri sulphas, ferri et ammonii citras, ferri et quinine citras, ferri carbonas saccharatus, ferri phosphas, ferri sulphas, ferri sulphas exsiccatus, ferrum redactum, ferrum tartaratum, hydrargyri iodidum rubrum, hydrargyri oxidum flavum, hydrargyri oxidum rubrum, hydrargyri perchloridum, hydrargyri subchloridum, hydrargyrum, hydrargyrum ammoniatum, iodium, magnesi sulphas, phosphorus, plumbi acetas, plumbi iodidum, plumbi oxidum, potassii bromidum, potassii chloras, potassii iodidum, potassii permanganas, potassii sulphas, potassii tartaras acidus, sodii sulphas, sulphur sublimatum, sulphur præcipitatum, zinci sulphas.

Æther, amyl nitris, chloral hydras, chloroformum, iodoformum, paraldehydum, spiritus ætheris nitrosi, spiritus rectificatus.

Aconiti radix, aloe barbadensis, aloe socotrina, aloinum, ammoniacum, araroba, asafetida, belladonnae radix, calumbæ radix, camphora, cannibis indica, cantharis, catechu, cinchonæ cortex, cascara sagrada, coce folia, colchici cormus, colocynthidis pulpa, conii fructus et folia, copaiba, cnbeba, digitalis folia, elaterium, ergota, filix mas, gentiane radix, glycerinum, guaiaci resina, hyoscyami folia, ipecacuanhæ radix, jaboraudi folia, jalapa, kino, myrrha, nux vomica, oleum morrhue, oleum ricini, oleum terebinthine, opium, physostigmatis semina, podophylli resina, podophylli rhizoma, quassie lignum, quinine sulphas, rhei radix, santonium, scammonie resina, scammonie radix, scilla, senegæ radix, scrua alexandrina et indica, strophanthi semina.

Candidates are required to give notice to the Secretary of the Court of Examiners (Mr. Frank Haydon, L.R.C.P., Apothecaries' Hall, Blackfriars, E.C.), on a form to be obtained from him, fourteen days previous to the examination, and to pay the fee (5*l*. 5*s*.) by cheque or post-office order at the same time. Candidates must be eighteen years of age, and must prove this by a certificate from parent, guardian, or nearest relative; they must also produce a certificate from a registered medical practitioner, an assistant of the Society holding a public appointment, or a qualified chemist that they have received six months' instruction in practical pharmacy. The fee for re-examination is 2*l*. 2*s*.

Two books on this examination have been published, both by ladies: "A Manual for Assistants' Examination," by Mabel F. Stanley (Renshaw), 3*s*. 6*d*., and

"The Apothecaries' Hall in Ireland grants an Assistants' certificate to persons over sixteen years of age who have two years' experience in practical pharmacy with a registered Irish apothecary or pharmaceutical chemist, and who pass an examination similar in scope to the foregoing. The examination is held on the first Friday of each month, except August. Fee, 2*l*. 2*s*., to be paid to the Secretary of the Hall, Mary Street, Dublin.

Schools of Pharmacy.

THE demand for educational advantages for chemists' assistants and apprentices has brought forth many excellent schools or colleges of pharmacy, and the various claims of these institutions make it oftentimes a difficult matter for a prospective pupil to decide upon the school best suited to his wants. The following paragraphs we have made as concise as possible, with a view to emphasising the advantages which the several schools offer. The points a student will need to bear in mind are (1) situation of the school, (2) cost of living in the locality, (3) school-fees, (4) whether any extras are charged for special books or apparatus. In regard to the last-named point it is the practice at most of the schools to require the student to provide a set of chemical apparatus for his own use, the cost of the set varying from 14s. 6d., upwards. The secretaries of each of the educational institutions mentioned below will be pleased to send the full prospectus on application, and personal interviews are always willingly provided. The evening classes held in almost every town under the Board of Education scheme, provide a means of instruction in chemistry, physics, and botany, which should not be neglected by chemists' apprentices. Some of these are mentioned in the following notes, and others are noted in the science section, but local inquiry should in all cases be made.

LONDON.

THE SCHOOL OF PHARMACY,

17 Bloomsbury Square, London, W.C.

Staff: BOTANY—Professor J. Reynolds Green, Sc.D., F.R.S.; Demonstrator: Eric Drabble, B.Sc. CHEMISTRY AND PHYSICS—Professor W. P. Wynne, D.Sc., F.R.S.; Assistant-Lecturer: T. E. Wallis, B.Sc.; Demonstrators: Harold Deane, J. T. Cart. PHARMACEUTICS—Professor Henry G. Greenish, F.I.C. (Dean); Demonstrator: Reginald R. Bennett.

The session commences on October 3, 1903. Two courses of study are given—an elementary and an advanced course. The elementary course includes subjects required for the Minor, and extends to the end of June, 1904. The advanced course extends from October to the end of March. Students may, however, enter the school at any time and for any subject or part of the course, but it is advantageous to enter at the commencement of the course in October. The fee for the elementary course is 32l. 11s. (in instalments), or 30l. (if paid in one sum), and for the advanced course 18l. 18s. or 18l. The lectures on the various subjects can be taken separately. Professor Greenish is the Dean of the School, but applications for prospectuses and admission to the School must be made to the Registrar of the Pharmaceutical Society.

SOUTH LONDON SCHOOL OF PHARMACY,

325 Kennington Road, London, S.E.

Visiting Examiner, Dr. John Muter, F.R.S.E. Staff: Mr. F. Armstrong, Mr. W. F. Mawer, F.C.S., Mr. J. Thomas, B.Sc., and Mr. A. H. M. Muter, F.I.C.

The session at this school lasts from September until the middle of July. Fresh courses of lectures for the Minor and Major begin in September, January, and April. The fees for the Minor are 8l. 8s. a term. A short term for the October examination is conducted at a fee of 4l. 4s. The Major fees are 6l. 6s. a term. A free-tuition scholarship is offered for competition at the end of August in each year, and is tenable for one year. The holder is entitled to instruction for the Major as well as for the Minor.

WESTMINSTER COLLEGE OF CHEMISTRY AND PHARMACY (LIMITED),

Trinity Square, Borough, London, S.E.

Teachers: Mr. G. S. V. Wills, F.L.S. (Principal), Mr. A. E. Bell, F.I.C., F.C.S., Mr. A. W. Knight (Pereira medalist), Mr. E. G. Price, Ph.C., Mr. H. S. Mills, and Mr. E. Walden (Secretary).

There are during the school year four courses of lectures, beginning in August, October, January, and April, and three

for the Major, beginning in September, January, and April. The fee for a Minor course is 8l. 8s.; two courses, 12l. 12s.; until qualified, 15l. 15s. Major course, 6l. 6s.; until qualified, 10l. 10s. Apothecaries' Hall, one course, 5l. 5s.; two courses, 8l. 8s.; until qualified, 10l. 10s. Evening lectures with practical work are also given, the fee for a three-months' course being 1l. 1s. Postal systems are arranged for all examinations. A special set of text-books has been published by the principal.

THE METROPOLITAN COLLEGE OF PHARMACY,

160 and 162 Kennington Park Road, London, S.E.

Staff: Mr. W. Watson-Will, F.L.S., F.C.S., Ph.C. (Principal). Mr. Harry Lucas, F.C.S., Ph.C., Mr. F. Filmer de Morgan, F.C.S., Ph.C., Mr. David J. Williams, F.C.S., Ph.C., Mr. Walter S. Carver (Secretary).

The session 1903-4 consists of three courses—viz., winter (September 1 to January 15), spring (January 1 to April 15), summer (April 1 to July 23). An autumn tutorial course is held from August 15 to October 12. Evening continuation classes, commencing on September 1, 1903, and lasting to July 1, 1904, are held on Monday, Tuesday, Wednesday, and Friday, and afford students engaged during the day an opportunity of a course of instruction identical with a day course. The fees are as follows: Major course, one session, 8l. 8s.; two sessions (spring and summer), 15l. 15s. Minor course, one session, 10l. 10s.; two sessions (spring and summer), 19l. 19s. Autumn tutorial course, 6l. 6s.

IMPERIAL COLLEGE OF CHEMISTRY,

49 and 51 Imperial Buildings, Ludgate Circus, London, E.C.

Principal, Mr. Frederick Davis.

Courses of study begin in January, April, July, and October. For the Minor examination students are advised to attend the school for six months, but the work may be covered in three months. The fee is 10l. 10s. for the three months' course, 17l. 17s. for six months, and students may enter for single subjects at fees from 1l. 1s. upwards. Evening classes are held on the first four nights of the week. Courses of instruction are organised to meet the requirements of the Apothecaries' Hall, the Institute of Chemistry, and the Conjoint Board of the Royal Colleges of Physicians and Surgeons. A feature of this college is the organisation of visits to chemical-works. Special Major tutorial course, 8l. 8s. Students are supplied with tickets for the Royal Botanic Gardens, Regent's Park, and fresh specimens are a feature of the botany lectures.

LONDON COLLEGE OF CHEMISTRY, PHARMACY, AND BOTANY,

323 Clapham Road, London, S.W.

Staff: Mr. Henry Wootton, B.Sc. Lond. (Principal), Mr. A. Kirkland, Ph.C., Mr. S. Royce, Ph.C., and Mr. J. Wilson, M.A., assisted by qualified demonstrators.

The terms commence on October 1 and at the beginning of January and April. The fees for the Minor course per term are 9l. 19s. 6d. (two terms, 17l. 17s.); Major, 6l. 16s. 6d. (two terms, 11l. 11s.). In addition to the regular lectures and practical work, special tutorial classes are held daily at 4 P.M., except Saturday. A special revision course for advanced students begins on August 19; fee to the October examination, 5l. 5s. Evening classes are held, the fees for which vary from 1l. 1s. to 2l. 7s. 6d., according to the number of classes attended each week.

Special classes are held daily in preparation for the Pharmaceutical and Medical Preliminary examinations of the College of Preceptors, the fee for which is 4l. 4s. per term of three months.

THE CENTRAL SCHOOL OF PHARMACY,

2 Charterhouse Street, E.C.

Principal, Mr. C. E. Sage, Ph.C., F.C.S.

Day classes are held for the Minor and Major, the courses commencing in September, January, April, and July. Even

ing classes, which cover the Minor syllabus, are held on Mondays, Wednesdays, and Fridays. The fee for a full-day course of seven months is 18*l.* 18*s.*; for the three-months' course, 10*l.* 10*s.* The evening-class fees are at the rate of 4*l.* 4*s.* for a three-months' course. A special class is held for the Apothecaries' Assistants' examination, and private tuition is given in chemistry for Medical and London University examinations. Mr. Sage's telephone number is 8,651 Central.

BRIXTON SCHOOL OF PHARMACY,

171 Brixton Road, London.

Principal, Dr. A. B. Griffiths, F.R.S.E.

Classes are held for the Minor, Major, and Apothecaries' Hall examinations. There is a post-graduate course in research-work and commercial analysis. The laboratories are fitted with the best appliances.

PROVINCIAL.

BARROW-IN-FURNESS.

At the Higher Grade School, Duke Street, evening classes are arranged in theoretical and practical chemistry and botany which are suited for pharmaceutical students. The session begins early in September, and particulars can be obtained from Mr. C. F. Preston, Town Clerk and Secretary.

BIRMINGHAM.

Mr. F. H. ALCOCK, F.I.C., *The Analytical Laboratory, Temple Chambers, Broad Street Corner*, gives tuition in all pharmaceutical subjects. Fees, 8*l.* 8*s.* per quarter. An instructive time-table will be sent on receipt of stamped addressed envelope.

THE CENTRAL SCHOOL OF PHARMACY, 93 *New Street*.—Mr. Stokes Dawson has day and evening classes for the Major and Minor examinations. The new courses begin on September 1.

MUNICIPAL TECHNICAL SCHOOL, *Suffolk Street*.—There are special courses of chemistry on Wednesday afternoons for the Minor examination, the next session commencing on September 16. The courses extend over two sessions, and consist in each course of about an hour's lecture and two hours' practical work, from 2.30 to 5.30 p.m., weekly. The fee for either lecture course is 2*s.* 6*d.*; for the combined course, 5*s.* The are also botany classes (elementary, advanced, and practical) suited for pharmaceutical students (fee 3*s.* 6*d.*), and a materia-medica cabinet has been provided by Southall Brothers & Barclay (Limited) for the use of students.

BLACKBURN.

Municipal Technical School.

A complete course of classes for the Minor examination has been established by the committee of the Technical Schools, of which Mr. J. Hindle is a member. Mr. G. B. Pickworth (72 Victoria Street, Blackburn), Hon. Secretary of the North-East Lancashire Chemists' Association, will give particulars of the arrangements to any chemist's assistant or apprentice.

BRADFORD MUNICIPAL TECHNICAL COLLEGE.

Head of Chemistry Department, Mr. W. M. Gardner. Lecturers in Chemistry, Mr. B. North and Mr. S. F. Stell. Lecturer in Botany, Materia Medica, and Pharmacy, Mr. W. West.

The general pharmaceutical course, which includes chemistry and physics (lectures and laboratory), botany (lectures and laboratory), materia medica and pharmacy, and dispensing (lectures and practical), extends over two years, and is arranged so that chemists' apprentices can completely prepare for the Minor and Major examinations of the Pharmaceutical Society during the course of their ordinary work. The classes are held on three afternoons each week, but evening classes are available for those who find it impossible to attend during the day.

BRIGHTON.

A pharmaceutical course for Minor students has been arranged at the Municipal School of Science and Technology, Richmond Terrace. The classes require the attendance of

students from 2 to 4.30 on Tuesdays, 10 to 12.30 on Wednesdays, 2 to 4.30 on Thursdays, and 2.30 to 3.30 on Fridays, and are thus available for apprentices and assistants whilst engaged in business; but evening classes are also available. The fee for a complete Minor course is 2*l.* 2*s.* The term begins on September 10.

BRISTOL UNIVERSITY COLLEGE.

Principal, Professor C. Lloyd Morgan, F.R.S. Professor of Chemistry, Dr. Sydney Young, F.R.S. Lecturer on Chemistry, Dr. Francis. Assistant-Lecturer on Chemistry and Lecturer on Pharmaceutics, Mr. Oliver C. M. Davis, B.Sc., Ph.C.

The chemistry classes at nominal fees are useful for pharmaceutical students, and instruction in practical chemistry can be had in the chemical laboratory at fees which depend on the number of evenings a week devoted to the subject. A special course in pharmaceutics, meeting the requirements of the Minor examination of the Pharmaceutical Society, will be given during the first and second terms. There is also a complete day course for the Minor examination, some particulars of which will be found in the *C. & D.*, July 11, page 51.

CAMBRIDGE.

The Cambridge Pharmaceutical Association, through their Secretary (Mr. B. S. Campkin, Mill Road), will furnish particulars of classes in botany and chemistry suitable for pharmaceutical students. The classes are held at the Technical Institute, in connection with the Science and Art Department, South Kensington.

DERBY.

Derby Technical College.

Principal, Mr. F. W. Shurlock, B.Sc., B.A. Teachers: Chemistry, Dr. A. J. Walker, B.A.; Botany, Mr. W. B. Randles, B.Sc.; Materia Medica, Mr. H. Hoare; Pharmacy, Mr. S. Taylor, Ph.C.

Classes for pharmaceutical students are held in the subjects required for the Minor and Major examinations. The classes commence at the end of September.

EXETER.

School of Pharmacy,

Royal Albert Memorial College.

Lecturers: Physics, The Principal and Mr. J. Trott. Chemistry, Mr. W. H. Lewis, M.A. Pharmacy, Materia Medica, and Pharmacy Law, Mr. H. Wippell Gadd. Botany, Mr. J. L. Sager, B.A.

A complete course of instruction for the Minor examination has been arranged in day and evening classes. Shorter courses are arranged for medical students and those preparing for the Assistants' examination of the Apothecaries' Society. The fees are moderate. Mr. H. Wippell Gadd's scheme of instruction is outlined in the *C. & D.*, August 1, page 244.

LANCASTER.

Municipal Technical School, the Storey Institute.

Principal, Mr. William French, M.A., F.I.C. Chemistry, The Principal and Mr. William Wyatt, Ph.C. Physics, Mr. T. C. Joyce, Inter. B.Sc., and Mr. T. McBrathney, B.Sc. Botany, Mr. William Wyatt, Ph.C.

Practical work as well as lectures given in all subjects.

LEEDS.

College of Pharmacy, Clarendon Road.

Principal, Mr. F. Pilkington Sargeant, F.C.S., Ph.C.

There are four Minor courses at this college during the year, beginning early in January, April, July, and October. Each course comprises 5½ days' work per week for six months, when the subjects are covered four times—twice in detail and twice in recapitulation. The fee for three months' full-time class, Minor or Major, is 8*l.* 8*s.*; for six months, 14*l.* 14*s.* For the evening and weekly classes the fee is 4*l.* 4*s.* for a six-months' course. Botanical excursions are organised on alternate Saturdays in the summer months. Classes are

also held for ladies desiring to qualify as dispensers. There are botanical gardens and conservatories in connection with the college.

The Yorkshire College, Victoria University.

There are courses in chemistry, physics, and botany at this college suitable for pharmacy students. Mr. J. H. Gough, Ph.C., F.C.S., is the demonstrator in practical pharmacy.

Leeds Technical School (in connection with the Leeds Institute of Science, Art, and Literature).

Head Master, Mr. R. E. Barnett, B.Sc., A.R.C.S.

There are evening courses of study at this school in chemistry, physics, and botany during the winter. The classes open early in September. A suitable course of classes in the above subjects has been arranged for pharmaceutical students. Particulars of this, with complete syllabuses, are given in the *Calendar* of the Institute, to be obtained (post-free, 5d.) from the Secretary, Mr. Arthur Tait, Leeds Institute, Cookridge Street.

LIVERPOOL.

School of Pharmacy, 6 Sandon Terrace, Upper Duke Street.

Principal, Mr. R. C. Cowley.

The full-time course of study for the Minor begins on September 8 and continues till Christmas, the fee being 10*l.* 10*s.* The January and April courses continue till the April and July examinations, the fee being 9*l.* 9*s.* The fee for two full courses, which is recommended by the principal, is 16*l.* 16*s.* Major full-time classes are held from nine to five daily, the fee for a course of three months being 9*l.* 9*s.* There are also part-time classes held on Wednesdays from 3 to 10 P.M., the session beginning in September. The fee for a full course is 7*l.* 10*s.* A tutorial class is held on Tuesdays for advanced students, and part-time students can attend on other days by arrangement.

*The University
School of Pharmacy.*

Chemistry, Professor J. C. Brown, D.Sc. Physics, Professor L. R. Wilberforce, M.A. Botany, Professor R. J. H. Gibson, M.A. *Materia Medica*, Professor W. Carter, LL.B. Lecturer on Pharmacy, Mr. Prosper H. Marsden, Ph.C.

Complete courses of instruction are provided, adapted to the requirements of candidates preparing for either the Minor or Major examinations of the Pharmaceutical Society of Great Britain. The Manchester Pharmaceutical Scholarship may be held at this school. The next session begins on October 1. Further information can be had of the Dean of the Medical Faculty.

MANCHESTER.

The Owens College Pharmaceutical Department.

Principal, Mr. A. Hopkinson, K.C., M.A. Dean, Professor William Stirling, M.D. Physics, Professor A. Schuster, Ph.D., F.R.S. Chemistry, Professor H. B. Dixon, F.R.S., and Professor W. H. Perkin, F.R.S. *Materia Medica* and Pharmacy, Professor R. B. Wild, M.D., M.Sc., M.R.C.P., and Mr. Jas. Grier, Ph.C. Lecturer in Pharmacognosy and Pharmaceutical Chemistry, Mr. Jas. Grier. Botany, Professor F. E. Weiss, D.Sc., and Dr. Darbishire, B.A.

The courses for the Minor and Major examinations each extend over one winter session (October to April). A composition fee of 15*l.* 15*s.*, payable at the commencement of the session, admits to the college courses for the Minor or Major examination. Students who have paid the composition fee for a winter session may continue their studies during the ensuing summer session for a further fee of 4*l.* 4*s.* The Manchester Pharmaceutical Scholarship is tenable at this college. Students have access to the specimens in the museum of *materia medica* and to the botanical portion of the Manchester Museum, Owens College, as well as to the books in the Leech Library. Pharmaceutical students who desire to obtain the degree of B.Sc. in the Victoria University, and who have passed the Preliminary examination, may so arrange their courses for the Minor and Major pharma-

ceutical examinations as to include the other subjects required for the Intermediate, which may be taken at the end of their second year. The Dean of the Medical School enrolls students for the winter session from September 28 to October 3.

*Manchester College of Pharmacy,
223A and 227A Oxford Road,*

Director, Mr. Chas. Turner, F.C.S.

The year's work is divided into the following courses: August 24 to January examination (fee 10*l.* 10*s.*), October to the April examination (fee 14*l.* 14*s.*), and January to the July examination (fee 14*l.* 14*s.*). Local classes are held on Tuesdays and Wednesdays from 2 to 10 P.M., and evening classes on Mondays, Wednesdays, and Fridays from 8 to 10 P.M. The fees for these classes are 4*l.* 4*s.* from January to July, and 3*l.* 3*s.* from August 24 to Christmas. The fees for the full-time class in preparation for the Major are at the rate of 2*l.* 2*s.* a month. There are also classes for the Apothecaries' Hall examination, the fee for a six months' course being 4*l.* 4*s.*

*Northern College of Pharmacy,
Burlington Street, Manchester.*

Principals, Mr. Geo. Clayton, F.C.S., and Mr. F. Lawson, B.Sc. (London).

For the Minor there are always four separate courses running—the full-time course, the evening course, the Tuesday afternoon course, and the Wednesday afternoon course. Though students can join any time, the best times are September and January. Fee at the full-time course for six months 14*l.* 14*s.*, three-and-a-half months 9*l.* 9*s.* Fee at the part-time courses, January to July, 4*l.* 4*s.*; September to January, 2*l.* 10*s.* For the Major the courses commence in October, January, and April. Fee at the full-time course, 6*l.* 6*s.* Courses are also held in preparation for the Apothecaries' Hall examination.

NEWCASTLE-ON-TYNE.

*North of England School of Chemistry and Pharmacy,
55 Northumberland Street.*

Principal, Mr. Frank R. Dudderidge, F.C.S.

There are four sets of Minor classes in operation at this school: Full-time day class, fee 8*l.* 8*s.* per term of twelve weeks; evening classes meeting three times a week, fee 3*l.* 3*s.*; afternoon classes on Wednesday and Thursday, fee for either day 3*l.* 3*s.*; and a special weekly class for junior assistants and apprentices. Day and evening classes are also held for the Major examination, at fees of 7*l.* 7*s.* per term for the day course and 3*l.* 3*s.* for the evening course. Terms commence in October, January, and April, and a short course of lectures for the October examinations commences on August 17.

The Durham College of Science.

Courses of lectures on chemistry, physics, and botany can be taken by pharmaceutical students at this college.

NOTTINGHAM.

*School of Pharmacy,
Carlton Chambers, 13 Victoria Street.*

Principal, Mr. A. Russell Bennet, F.C.S., Ph.C.

A series of three classes is conducted here for the Minor. The full-time day-classes meet from 9.30 A.M. to 5 P.M. Evening-classes are held three times a week, from 8.15 to 10.15 P.M., and afternoon-classes on Wednesdays and Thursdays. The fee for a term of three months is 8*l.* 8*s.*, or 15*l.* 15*s.* for two terms in the day-classes, and the evening and afternoon classes are 3*l.* 3*s.* for a three-months' course. In September there will be an examination for a scholarship and prizes at the school, when questions in botany, *materia medica*, organic chemistry, and pharmacy will be set. Classes are now held in all the subjects for the College of Preceptors' examination, the fee for which is 2*l.* 2*s.* per term of three months.

University College.

Classes are held in all the subjects required for the Minor and Major, and the necessary work is arranged for in the

chemical, botanical, and physical laboratories in evening classes. The fees range from 5s. to 15s. the course. Professor F. S. Kipping, F.R.S., is the head of the chemistry department.

PLYMOUTH.

Municipal Science, &c., Schools.

Lecturers in Chemistry, Mr. J. B. Brown, B.Sc., and Dr. J. R. Thackrah, M.A.

There are courses of chemistry, botany, physics, and practical chemistry, and, the classes being held in the evening, they are very convenient for pharmacy students.

UNIVERSITY COLLEGE, READING, SCHOOL OF PHARMACY.

Principal: Mr. W. M. Childs, M.A. Lecturers: Chemistry, Dr. C. M. Luxmoore, F.I.C.; Physics, Dr. G. J. Burch, F.R.S.; Botany, Mr. F. W. Keehle, M.A.; Materia Medica, Mr. B. J. Austin, F.L.S.

The subjects of study are those comprised in the syllahuses of the Minor and Major examinations. A complete course for either examination extends over three terms, the composition fee for which is 18l. Students who are well forward may enter for two terms. Students can compound for tuition-fees and board and lodging for the session for 52l. Particulars can be had by addressing the College Registrar.

SHEFFIELD.

*College of Pharmacy, Princess Buildings,
116A-118A the Moor.*

Principal, Mr. J. W. J. Turner, Ph.C.

Day classes are held, commencing the first week in October, January, and April. The fees for a three-months' Major course are 6l. 6s.; Minor, 8l. 8s.; for a six-months' Minor course the fee is 13l. 13s. Evening and part-time classes are held, and correspondence classes are also in operation.

University College.

Classes in the three-years' course for Minor students are held on Wednesday, Thursday, and Friday evenings, the session beginning on October 7. Mr. John Austen, Ph.C., is the lecturer in materia medica. The fees are: Materia medica, 10s. 6d.; chemistry, two years, 30s. each; practical chemistry, 30s.; botany, two years, each 30s.

SOUTHAMPTON.

Instruction in chemistry and botany can be had in day and evening classes at the Hartley College.

SPALDING.

Grammar School.

Evening classes are held in practical chemistry, suitable for Minor students, Mr. E. Wightman Bell, F.C.S., being the teacher.

WOLVERHAMPTON.

Municipal Science and Technical School.

Teachers: Inorganic and Organic Chemistry, Mr. W. Whitehouse, F.C.S.; Physics, Messrs. W. Whitehouse and W. J. Rogers; Botany, Mr. Sidney Phillips, Ph.C.; Latin, Mr. F. G. Griffiths, M.P.S.

Day classes (the session begins on September 15) are held in chemistry and physics, and evening classes in chemistry, physics, and botany. Special arrangements are made for the requirements of pharmaceutical students. For other particulars and programme, the Secretary should be addressed.

SCOTLAND.

ROBERT GORDON'S COLLEGE IN ABERDEEN.

School of Pharmacy.

Head Teacher, Mr. Gilbert Simpson, Ph.C.

The pharmaceutical department of this college embraces courses of study for the Minor and Major examinations. The term for the October examination begins on August 24. The next ordinary courses begin (1) October 5, (2) January 4,

and (3) April 4. The fee for the short course is 3l. 3s.; for full course, 7l. 7s. Evening classes are also held, for which the fee is 3l. 13s. 6d.; the next course begins on September 28. Single subjects, the fees for which range from 10s. 6d. to 21s., may be taken if desired. The Aberdeen Pharmaceutical Association offer prizes (each consisting of three months' free tuition in the day classes) to students of the evening school at the end of the session.

THE ROYAL DISPENSARY AND SCHOOL OF PHARMACY, 21 West Richmond Street, Edinburgh.

Principal, Mr. William Duncan, Ph.C., F.C.S., assisted by Mr. W. G. Mackenzie, Ph.C., and Mr. E. J. Brown, Ph.C.

The session is divided into three terms, commencing in October, January, and April, elementary and advanced courses being carried on simultaneously. For Minor and Major students the fee for one term is 8l. 8s.; shorter terms at proportional rates. Evening classes, covering the same ground as the day classes, are held on Monday, Tuesday, and Thursday at 8.30. Fee, 3l. 3s. for a three-months' course, which begins in September.

CENTRAL SCHOOL OF PHARMACY, 26 Clyde Street, Edinburgh.

Principal, Mr. W. B. Cowie, Ph.C. Assistants, Messrs. W. McEwen, Robert Henderson, and A. C. Cameron, M.A.

Full courses of instruction commence in October, January, and April, and a short course begins in August. Evening classes are also held. Fees per quarter for Minor or Major course, 8l. 8s. (day) and 3l. 3s. (evening). A class for preparing students for Preliminary examinations the certificates of which are accepted by the Pharmaceutical Society is held on Monday and Thursday evenings at a fee of 1l. 1s. per quarter.

GLASGOW SCHOOL OF PHARMACY, Blythswood Chambers, 180 West Regent Street, Glasgow.

Principal, Mr. John Lothian, Ph.C., assisted by Mr. Bertram Cockburn, Ph.C.

Full courses for the Minor and Major commence on October 6 and continue to March 31, 1904. The summer course begins on April 4, 1904. Fees, 8l. 8s. per quarter. An autumn tutorial course begins on August 15, the fee being 4l. 4s. Evening classes (begin October 5) are 1l. 1s. per quarter for each subject, one evening a week.

WEST OF SCOTLAND COLLEGE OF PHARMACY, 157 St. Vincent Street, Glasgow.

Principal, Mr. T. S. Barrie, F.C.S., assisted by Messrs. W. Graham, J. McKenzie, M.A., and Thomas McMaster, M.A.

At this college there are three terms, beginning in October, January, and April. The fees for the day classes for the Minor are 8l. 8s. per term of three months, or 15l. 15s. for six months. Evening and correspondence classes are also held, the fees for the evening classes being at the rate of 1l. 1s. per term for one night per week. A special class for country students is held on Tuesday afternoon from 2 to 9 P.M. General education classes for students preparing for the examination of the Educational Institute of Scotland are also held in the evening. The fees for six months' tuition are: Junior course, 30s.; senior course, 37s. 6d.

IRELAND.

MUNICIPAL TECHNICAL INSTITUTE, BELFAST.

Principal, Mr. Fras. C. Forth, Assoc.R.C.Sc.I. Teaching Staff of Pharmaceutical Department: Mr. S. Templeton, Assoc.R.C.Sc., F.I.C.; Mr. T. Harper, M.P.S., L.P.S.I.; Chas. McMullan, A.I.C. Laboratory Assistant, Chas. J. Still.

Full courses of instruction in all pharmaceutical subjects begin in the week commencing September 21. Additional courses of instruction in practical chemistry, botany, and materia medica begin on January 4, 1904. Fees: Chemistry, 10s.; practical chemistry (100 hours), 1l. 10s.; botany, 7s. 6d.; materia medica, 7s. 6d.; pharmacy, 10s.

PHARMACEUTICAL SCHOOLS OF CHEMISTRY, BOTANY, AND
MATERIA MEDICA,

67 Lower Mount Street, Dublin.

Practical Chemistry Class, Director Professor Tichborne; Demonstrator Mr. P. Kelly, M.P.S.I.; Theoretical Chemistry and Physics, Mr. T. A. Shegog, F.I.C., F.C.S.; Directors of the Botany and Materia Medica School, Messrs. H. Hunt, M.P.S.I., and A. H. Laird.

The fees for the courses in accordance with the regulations of the Society are: Practical chemistry (six months), 6*l.* 6*s.*;

theoretical chemistry and physics (four months), 1*l.* 1*s.*; botany and materia medica (three months), 2*l.* 2*s.* The practical chemistry class is held on Mondays, Wednesdays, and Fridays from 8 to 10 P.M., and comprises at least a hundred hours' actual bench-work. The class for theoretical chemistry and physics is held on Tuesdays and Thursdays from 8 to 9.30 P.M. Each session of the School of Botany and Materia Medica consists of twenty-six lectures, and the classes are held on Tuesdays and Thursdays at 8 P.M., with occasional Saturday demonstrations. The Registrar, 67 Lower Mount Street, Dublin, will furnish full particulars, and receives the fees.

Medicine.

IT is advantageous to begin this section with an extract from the Medical Act, 1858, which shows that, although the registered holders of medical titles are protected, the practice of medicine by other persons is not specifically prohibited:

Any person who shall wilfully and falsely pretend to be or take or use the name or title of a physician, doctor of medicine, licentiate in medicine and surgery, bachelor of medicine, surgeon, general practitioner, or apothecary, or any name, title, addition, or description implying that he is registered under this Act, or that he is recognised by law as a physician or surgeon, or licentiate in medicine and surgery, or a practitioner in medicine, or an apothecary, shall, upon a summary conviction for any such offence, pay a sum not exceeding 20*l.*

No person shall hold any appointment as a physician, surgeon, or other medical officer, either in the military or naval service, or in emigrant or other vessels, or in any hospital, infirmary, dispensary, or lying-in hospital, not supported wholly by voluntary contributions, or in any lunatic asylum, gaol, penitentiary, house of correction, house of industry, parochial or union workhouse or poorhouse, parish union, or other public establishment, body, or institution, or to any friendly or other society for affording mutual relief in sickness, infirmity, or old age, or as a medical officer of health, unless he be registered as a general medical practitioner.

The privileges of registered medical practitioners are defined in the Act thus:

On and after the appointed day a registered medical practitioner shall, save as in this Act mentioned, be entitled to practise medicine, surgery, and midwifery in the United Kingdom, and (subject to any local law) in any other part of his Majesty's dominions, and to recover in due course of law in respect of such practice any expenses, charges in respect of medicaments or other appliances, or any fees to which he may be entitled, unless he is a Fellow of a college of physicians the Fellows of which are prohibited by law from recovering at law their expenses, charges, or fees, in which case such prohibitory by-law, so long as it is in force, may be pleaded in bar of any legal proceedings instituted by such Fellow for the recovery of expenses, charges, or fees.

It is, however, an offence under the Apothecaries Act, 1815, to act as an apothecary, such being defined by the Courts as "a person who professes to judge internal disease by its symptoms, and to cure that disease by medicine."

Our purpose in this article is to give intending medical students an idea of the curriculum necessary to become a registered medical man.

First it is necessary to be registered as a medical student, and before this can be done a recognised Preliminary examination must be passed and the applicant must be sixteen years old. Application for registration must be made to the Branch Registrar of the division of the United Kingdom in which the applicant resides. The addresses of the Branch Registrars are

England and Wales—293 Oxford Street, London, W.

Scotland—48 George Square, Edinburgh.

Ireland—35 Dawson Street, Dublin.

Forms of application for registration are supplied by the Registrars or by the medical school at which the student intends to take his curriculum.

Having registered himself as a medical student, which must be done within fifteen days of entering upon his studies, he commences his five years' course in earnest. By a regulation of the Royal College of Physicians and Surgeons, students seeking their diploma do not require to register provided they pass the required Preliminary ex-

amination and go through five years of study, but it is always advisable to register in any case, so that should the student seek other diplomas under which registration is necessary, he may have no impediment of this character in his way. We have said that in all schools the course of study is essentially the same. The student has to undergo three stages during the five years—(1) elementary science, (2) anatomy and physiology, (3) medicine, surgery, midwifery, and their special branches. The detailed list of subjects is as follows:

- (i.) Physics, including the elementary mechanics of solids and fluids, and the rudiments of heat, light, and electricity.
- (ii.) Chemistry, including the principles of the science, and the details which bear on the study of medicine.
- (iii.) Elementary biology.
- (iv.) Anatomy.
- (v.) Physiology.
- (vi.) Materia medica and pharmacy.
- (vii.) Pathology.
- (viii.) Therapeutics.
- (ix.) Medicine, including medical anatomy and clinical medicine.
- (x.) Surgery, including surgical anatomy and clinical surgery.
- (xi.) Midwifery, including diseases peculiar to women and to new-born children.
- (xii.) Theory and practice of vaccination.
- (xiii.) Forensic medicine.
- (xiv.) Hygiene.
- (xv.) Mental disease.

The first four of the five years must be passed at a school or schools of medicine recognised by any of the licensing bodies, provided (a) that the first year may be passed at a university or teaching institution, recognised by any of the licensing bodies, where the subjects of physics, chemistry, and biology are taught; (b) that graduates in arts or science of any university recognised by the Medical Council, who shall have spent a year in the study of physics, chemistry, and biology, and have passed an examination in these subjects for the degrees in question, shall be held to have completed the first of the five years of medical study.

The midwifery practice required is three months' attendance on the indoor practice of a lying-in hospital, or attendance at twenty labours, at least five of which shall have been conducted throughout under the direct supervision of a registered practitioner. These are the General Medical Council's requirements.

To assist the student in the selection of the qualification for which he is to aim, we give details of the various qualifications available. The United Kingdom divides itself into four sections—London, English Provinces, Ireland, Scotland.

London.—The facilities for medical study in London are great. The diploma of M.R.C.S.Eng. and L.R.C.P.Lond. ("double qual.," as it is called) is most popular. There are also the London M.B. and the Apothecaries' Licence available.

Provinces.—Birmingham, Leeds, Liverpool, Manchester, and Newcastle-on-Tyne have medical schools affiliated to the local universities, the students proceeding to the university degrees. Cambridge and Oxford have medical schools, which, however, require residence for a specified period. There are medical schools in other provincial cities (see page 331), and the students of these take the double qual. or the London M.B.

Ireland.—M.B.Dublin and M.B.R.U.I. are the popular qualifications in Ireland: the former requires residence in Dublin, the latter is open to students from all recognised

schools. The Irish double qual. and the Scotch triple qual. are also popular in Ireland.

Scotland.—There are four universities in Scotland, in which the conditions for medical graduation are the same. It is usual to matriculate at one or the other, and take the M.B., Ch.B., degrees. A few take the Scotch triple qual., as do also some English and Irish students.

A degree allows the holder to prefix "Dr." to his name, otherwise degrees and diplomas are much the same as regards advantages. The most popular degree appears to be that of Edinburgh University; the most popular diploma the M.R.C.S.Eng. and L.R.C.P.L.

THE QUALIFICATIONS.

L.R.C.P.Lond. and M.R.C.S.Eng.

This, the "English double qual.," is conferred by the Royal College of Physicians of London and the Royal College of Surgeons of England, acting through a Conjoint Examining Board which meets at the Examination Hall, Victoria Embankment, W.C. There are three professional examinations:

The *First* consists of three parts (which may be taken as soon as the class certificates are obtained): Chemistry and physics, practical pharmacy, biology. These may be taken separately or together, and pharmacy may be taken at any time during the curriculum. Fee, 10*l.* 10*s.*

The *Second* examination is in anatomy and physiology, and both must be passed together not less than nine months after passing the *First*. Fee, 10*l.* 10*s.*

The *Third* or *Final* examination consists of three parts: (i.) Medicine (medical anatomy, pathology, pharmacy if not already passed, therapeutics, forensic medicine, and public health); (ii.) surgery (pathology and surgical anatomy); (iii.) midwifery and gynecology. These may be passed separately or together two years after the second examination has been passed, but the examination cannot be completed until the end of the five years' study subsequent to the Preliminary. Fee, 21*l.*

Communications should be made to the Secretary, Examination Hall, Victoria Embankment, London, W.C. In all cases certificates of professional study are required before the student is admitted to the examination, and, in cases of failure, further study for three months must be certified before re-examination.

L.R.C.P.&S.Edin. and L.F.P.S.G.

This is known as the Scotch "triple qual.," and is conferred by the Conjoint Board of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow. The examination is held in Edinburgh and Glasgow. Applications should be addressed to Mr. Jas. Robertson, 54 George Square, Edinburgh, or Dr. Alexr. Duncan, 242 St. Vincent Street, Glasgow. The curriculum occupies four collegiate sessions (winter and summer), but a fifth year must be devoted to practical clinical work, and six months of this year may be spent as a pupil of a registered practitioner. There are four professional examinations:

First.—Physics, chemistry, biology, which may be taken separately. Fee, 5*l.*

Second.—Anatomy and physiology. A candidate may be passed in one subject while failing in the other, and the examination may be taken any time after the end of the second year provided the requisite courses of study have been gone through. Fee, 5*l.*

Third.—Pathology, materia medica, and pharmacy, at the end of the third year. Fee, 5*l.*

Final.—Medicine, surgery, midwifery, and medical jurisprudence. The student must be twenty-one, and may not pass till the end of the fifth year. The examination may be taken separately or together. Fee, 15*l.*

L.R.C.P.I. and L.R.C.S.I.

This is conferred by the Conjoint Board of the Irish Colleges, and is known as the Irish "double qual." The examinations are very similar to those of the Scotch Board, there being four professional examinations:

First.—Chemistry and physics, biology. Fee, 15*l.*

Second.—Anatomy, physiology, and histology. Fee, 10*l.* 10*s.*

Third.—Pathology, materia medica and pharmacy, public health and forensic medicine. Fee, 9*l.* 9*s.*

Final.—Medicine, surgery, midwifery. Fee, 6*l.* 6*s.*

A five years' curriculum is required. Secretary, Mr Greenwood Pim, 6 Kildare Street, Dublin.

L.S.A.

The diploma of Licentiate of the Society of Apothecaries entitles the holder to practise medicine. There are two examinations, the Primary and the Final.

Primary.—Biology, chemistry and physics, pharmacy, anatomy, physiology, and histology. Fee, 5*l.* 5*s.*

Final.—Surgery, pathology, medicine, forensic medicine, midwifery, clinical surgery, clinical medicine, and medical anatomy. Fee, 15*l.* 15*s.*

A curriculum of five years is required, particulars of which may be had from the Secretary, Court of Examiners, Apothecaries' Hall, Blackfriars, E.C. The subjects of examination fall like those of the "double qual."

L.A.H.

The Apothecaries' Hall of Ireland gives a licence similar to that of the English Society. There are four professional examinations, viz.:

First.—Biology, physics, chemistry, pharmacy. Fee, 5*l.* 5*s.*

Second.—Anatomy, materia medica, therapeutics, physiology, histology. Fee, 5*l.* 5*s.*

Third.—Pathology, medical jurisprudence, hygiene. Fee, 5*l.* 5*s.*

Final.—Medicine, surgery, midwifery. Fee, 6*l.* 6*s.*

Address: The Registrar, Apothecaries' Hall, 40 Mary Street, Dublin.

Oxford Degrees.

There are two degrees in medicine and surgery granted by Oxford—viz., B.M. and D.M. (medicine), and B.Ch. and M.Ch. (surgery). It takes at least six or seven years to obtain them. B.M. and B.Ch. are granted only to those who have taken the B.A. degree. There are a Preliminary and two professional examinations:

Preliminary.—Mechanics and physics, chemistry, zoology, botany.

First Professional.—Organic chemistry, anatomy and physiology, materia medica, pharmacy.

Second Professional.—Medicine, surgery, midwifery, pathology, forensic medicine, hygiene.

A B.M. who has entered his thirty-ninth term is admitted D.M. on presentation of a dissertation approved by the appointed professor and examiners.

M.Ch. Degree.—An examination for this degree is held in June. The candidate must have entered his twenty-seventh term.

The fees, together with cost of living and extras, amount to a considerable sum, but valuable scholarships are available.

Camb.idge Degrees.

Cambridge grants the degrees of M.B., B.C., and of M.D. and M.C. For the first of these the conditions are that the student must (1) become a matriculated student of the University, (2) reside in the University during the required portion of each of nine terms, (3) pass (or obtain exemption from) the Previous examination, (4) follow medical study for five years, (5) pass three examinations and keep an Act. These last are:

First.—Chemistry, biology.

Second.—Anatomy, physiology.

Third.—Pharmacology, pathology, surgery, midwifery, practice of physic.

Act for M.B.—After these examinations the student is questioned on a thesis prepared by himself, and on medicine generally, before he is granted his degree.

B.C. degree is granted to candidates who pass the third examination, and without the Act.

M.D.—An M.B. of three years' standing can, by "keeping an Act" (as shown for the M.B. degree), obtain the degree of M.D.

M.C. is granted to those who have obtained the B.C., under certain conditions.

Particulars as to fees, &c., may be obtained on application to the Registrar of the University, The Registry, Cambridge.

Durham Degrees.

These are M.B., M.D., B.S., M.S. A curriculum is required one year of which must be spent at the Durham College of Medicine, Newcastle-on-Tyne, and there are four professional examinations. Particulars of Professor Howden, College of Medicine, Newcastle-on-Tyne.

London Degrees.

The University of London grants the degrees of M.B. and M.D., also B.S. and M.S. Some details of these are given on page 313, but it will be noted that the new regulations for medical and surgical degrees are not yet issued. The Registrar of the University of London, South Kensington, S.W., should be addressed for particulars.

Victoria University Degrees.

The colleges of the Victoria University were till recently Owens College, Manchester; University College, Liverpool; and the Yorkshire College, Leeds; but at the time of writing the Victoria University is being dismembered. Liverpool has received a charter of its own, and Manchester and Leeds are in a fair way to becoming independent Universities. For the present, however, it may be taken that the conditions as to medical degrees are the same as those of the Victoria University. The degrees of M.B., Ch.B., and of M.D., Ch.M. are granted. A curriculum of five years is required, and there are three professional examinations for the M.B. degree. This and other degrees are granted under conditions very similar to the London degrees, and the fees are the same as London.

Address the Deans of the respective medical faculties.

Birmingham Degrees.

Birmingham University grants the degrees of M.B., Ch.B., M.D., and Ch.M. The first four years of the curriculum must be passed at the University, and there are five professional examinations for M.B., and the usual thesis or examination for the higher degree. Fees, first and second 5*l.* each, third 1*l.*, fourth 3*l.*, final 5*l.* Dean, Professor Windle, at the University.

Liverpool Degrees.

See Victoria University degrees.

Scotch Degrees.

The regulations for all the Scotch universities are identical. Four degrees are conferred—viz., Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Doctor of Surgery. We give the details of the University of Edinburgh, those of Glasgow, Aberdeen, and St. Andrews being practically the same. A Preliminary examination is required to be passed before entering, the subjects being (1) English, (2) Latin, (3) elementary mathematics, (4) Greek, or French, or German. A five years' curriculum must be passed, and two years must be spent at the University, the remaining three at some other recognised school. Of the sixteen professional subjects at least eight must be taken at the Scotch University, whose degree is desired, or in some university recognised for the purpose by the University Court. There are four professional examinations similar in style and subjects to those required by other medical schools. The full qualification is M.B., B.Ch.

Application for the various Scotch universities should be made to the Dean of the Faculty of Medicine, University of Edinburgh, Glasgow, Aberdeen, or St. Andrews, Dundee.

Irish Degrees.

The University of Dublin (Trinity College) grants the degrees of M.B., B.Ch., and B.A.O. (obstetrics). The conditions and regulations are very similar to those of Oxford, *q.v.* Address: The Registrar, School of Physic, University of Dublin.

The Royal University of Ireland grants two degrees in medicine (M.B. and M.D.), two in surgery (B.Ch. and M.Ch.), and two in obstetrics (B.A.O. and M.A.O.). The curriculum is at least five years. Graduates in arts or science under certain conditions are exempted from the first year of study. Matriculation and First university examinations are required from candidates for any degree. These each cover Latin, English, mathematics, natural philosophy, and a language, the "First" going more deeply into the subjects than the Matriculation. For "Bachelor" degrees three professional examinations are required, which may be passed with honours, and the higher degrees are obtained by further

special examinations. Fees: Matriculation, 1*l.*; First university examination, 1*l.*; first, second, and third examinations in medicine, each 1*l.*; degrees, 2*l.*; admission to degrees, 10*l.*; higher degrees, each 5*l.*

Women are Admitted

as candidates for degrees or diplomas by the Universities of London, Durham, Edinburgh, Glasgow, Aberdeen, St. Andrews, and Royal University of Ireland, and the Conjoint Boards of the Royal Colleges of Physicians and Surgeons in Scotland and Ireland, and the Apothecaries Hall in Ireland.

Medical Schools.

We give below a list, with a few particulars, of the schools and colleges recognised by the authorities as proper places of tuition for medical students. Further details may be learned by addressing the respective deans or secretaries:

LONDON.

Charing Cross Hospital, The Medical School, Chandos Street, W.C.—Fees, 120*l.* 15*s.*, or 132*l.* 6*s.* in instalments. There is a reduction made to the sons of registered medical practitioners. Dean, Mr. H. F. Waterhouse.

Guy's Hospital, London Bridge, S.E.—Fees, 157*l.* 10*s.*, or 168*l.* in instalments. Has a residential college, in which rooms cost from 14*s.* to 27*s.* per week, and board 1*l.* 1*s.* per week. Dean, Dr. J. Fawcett.

King's College, Strand, W.C.—Fees for London M.B. curriculum, 148*l.*, or 164*l.* in four instalments. (All students must attend a course of Divinity lectures in the first year, unless exempted.) Dean of the Faculty of Medicine, Professor W. D. Halliburton, M.D.

London Hospital, Mile End, E.—Fees, 126*l.*, or 136*l.* 10*s.* in instalments (sons of medical men 15*l.* 15*s.* less). Contains 786 beds, and is the largest accident hospital in the world. A new block has been added for better accommodation and more adequate teaching in the various departments. Warden, Mr. Munro Scott, Turner Street, Mile End, E.

London (Royal Free Hospital) School of Medicine for Women, 8 Hunter Street, Brunswick Square, W.C.—Fees, Intermediate and Final M.B. Lond. course, including hospital practice, 125*l.*, or 135*l.* in four instalments. Laboratory and Library fees, 6*l.* Classes for preliminary scientific M.B. Lond. examinations, 30*l.* Laboratory and library fees, 3*l.* Course for conjoint colleges &c., including elementary science and hospital practice, 135*l.*, or 145*l.* in four instalments. Laboratory and library fees, 6*l.* A School Scholarship of 30*l.* for one year and a St. Dunstan's Medical Exhibition of 60*l.* a year for three years (may be extended to five years) are offered in September. Dean, Miss Cock, M.D.

Middlesex Hospital, Cleveland Street, W.—Fees, 141*l.* 15*s.*, or 147*l.* in instalments. Dean, Mr. J. Murray, F.R.C.S. Residential college, 14*s.* 6*d.* to 17*s.* 6*d.* per week (exclusive of board). Warden, Dr. R. A. Young. The winter session opens on October 1, when an address will be given by Mr. W. Hern, M.R.C.S., L.D.S.

St. Bartholomew's Hospital, West Smithfield, E.C.—Fees, 30 guineas entrance and 30 guineas annually for five years. Has a residence for students. Warden, Mr. W. D. Harmer. Scholarship examinations, September 21.

St. George's Hospital, Hyde Park Corner, S.W.—Fees, 150*l.*, or 160*l.* in instalments, with a dissecting-room charge of 3*l.* 3*s.* per annum. Deans, Dr. Arthur Latham and Mr. F. Jaffrey. Secretary, Mr. Clifford Chadwick.

St. Mary's Hospital, Cambridge Place, Paddington, W.—Fees for full curriculum, 140*l.*, or 145*l.* in instalments. Dean, Dr. H. A. Caley.

St. Thomas's Hospital, Albert Embankment, S.E.—Fees—see prospectus to be obtained from the Medical Secretary, Mr. G. Rendle.

University College, Gower Street, London, W.C.—Faculty of Medicine fees, 157*l.* 10*s.*, or 162*l.* 15*s.* in instalments. Scholarship examinations September 22, 23. Dean, Professor Sidney Martin, F.R.S. At the opening of the session, on October 15, Professor E. H. Starling, F.R.S., is to give the introductory lecture.

Westminster Hospital, Caxton Street, S.W.—Fees, 115*l.* 10*s.*, or 141*l.* 15*s.* in six instalments. Dean, Dr. Gossage. Scholarship examinations are to be held on September 22 and 23, 1903, and April 22 and 23, 1904.

ENGLISH PROVINCES.

Aberystwyth and **Bangor**, as far as the First Professional examination is concerned.

Birmingham.—*University Faculty of Medicine.* Fees (complete for double qualification, including dissections), 154*l.* 19*s.* 6*d.* Dean, Professor Bertram C. A. Windle.

Bristol.—*University College.*—Students can complete in Bristol the entire course of study required for the Medical and Surgical Degrees of the University of London. Fees, 68*l.* 5*s.*, or 57*l.* 15*s.* with extras (in one sum). Dean, Professor E. Markham Skerritt, M.D. Registrar and Secretary, James Rafter.

Cambridge.—*University Medical School.* Apply to the Registrar, the University Registry, Cambridge.

Cardiff.—*University College.*—Instruction is given for the Preliminary scientific and Intermediate M.B. examinations, Lond., and for the corresponding examinations of other universities. Fees, 57*l.* 10*s.*, or for Conjoint Board 40*l.* Apply to Dean, or Registrar.

Leeds.—*Yorkshire College, Victoria University* (in state of transition).—Fees for M.B., Ch.B. Vic. and diplomas 67*l.* 4*s.*, hospital 42*l.*, fevers and vaccination 3*l.* 13*s.* 6*d.* (112*l.* 17*s.* 6*d.*), Preliminary Scientific year 27*l.* 11*s.* 6*d.*, and 18*l.* 1*s.* 6*d.*, respectively. Dean, de B. Birch, M.D.

Liverpool.—*University.*—The following estimate of the cost of medical education at this College is given in the prospectus: Composition fees: Science course, 24*l.* 15*s.*; medical course, 60*l.*; Infirmary course, 42*l.*; necessary extra classes, 20*l.*; examination-fees for M.B. Vic., 15*l.*; books and instruments, 50*l.* Total, 211*l.* 15*s.* Dean, Professor Paterson.

Manchester.—*Owens College.*—Fees for M.B. Vic., 133*l.* 5*s.*, exclusive of special courses. Dean, Professor William Stirling, M.D.

Newcastle-on-Tyne.—*Durham College of Medicine.*—Fees, 101*l.* 17*s.*, with some extras. Secretary, Professor Robert Howden.

Oxford has an excellent school of medicine.

Sheffield.—*University College* (Department of Medicine).—Fees, about 110*l.* Dean, Dr. W. T. Cocking, Leopold Street.

SCOTLAND.

Aberdeen.—*University Faculty of Medicine.*—Fees, about 100*l.* Secretary, Mr. Donaldson R. Thom, M.A.

Dundee.—*University College.*—Classes and hospital practice for the degree of M.B. and degree in Public Health. The college is affiliated to St. Andrews University. Secretary, Mr. R. N. Kerr.

Edinburgh.—*University Faculty of Medicine.*—Minimum class and hospital fees, 115*l.* Dean, Professor A. R. Simpson.

School of Medicine of the Royal Colleges.—The minimum cost of the education at this school for the triple qualification, including examination-fees, is 115*l.*, which is payable by instalments during the period of study. There are special classes for women. Secretary, Mr. R. N. Ramsay, solicitor, 27 Forrest Road, Edinburgh, who will forward the calendar of the school gratis.

Glasgow.—*University Faculty of Medicine.*—Fees about 140*l.* Dean, Professor McCall Anderson.

Anderson's College Medical School, Dnmbarton Road.—Last winter 230 students matriculated, and in summer 210. Fees for Scottish triple, about 70*l.*; but the course of study is suitable for any medical qualification. Communications to Dr. Alex. Duncan, Faculty Hall, 242 St. Vincent Street, Glasgow.

Queen Margaret College, Hamilton Drive, Glasgow (Glasgow University School of Medicine for Women). Fees for M.B., about 110*l.* 5*s.* Hon. Secretary, Miss Galloway.

St. Mungo's College, 86 Castle Street.—Fees for English and Scottish conjoint qualifications, about 65*l.* The Dean will supply a detailed syllabus.

St. Andrews University.—*Faculty of Medicine.*—The subjects for the whole of the curriculum are taught. (See also Dundee.) Fees, 3*l.* 3*s.* per subject. Secretary and Registrar, Mr. J. E. Williams.

IRELAND.

Belfast.—*Queen's College.*—Fees, about 95*l.* Registrar, Dr. Johnson Symington, F.R.S.

Cork.—*Queen's College.*—Fees (for M.B., R.U.I.), about 85*l.* Registrar, Mr. Alexander Jack, M.A.

Dublin.—*Catholic University Medical School*, Cecilia Street, Dame Street.—Minimum cost of lectures, hospitals, special courses, and examination may be put as follows: Royal University, 160*l.*; Conjoint Colleges, 162*l.*; Apothecaries' Hall, 141*l.* A capital Guide to the Medical Examinations is issued by the Registrar, Dr. A. Birmingham.

School of Physic in Ireland (Trinity College).—Fees, 149*l.* 6*s.* 6*d.* Registrar, H. W. Mackintosh, M.A., Trinity College.

Royal College of Surgeons in Ireland.—Schools of surgery, including Carmichael and Ledwich Schools. Total expense of triple qualification 160*l.* 13*s.*, made up of school-fees 63*l.*, hospital-fees 55*l.* 13*s.*, and examination-fees 42*l.* Examinations for the triple qualification are held in April, June, and October. The winter session commences October 1. The Registrar, St. Stephen's Green, Dublin.

Galway.—*Queen's College.*—Fees, as at Cork. Registrar, Professor Townshend.

Dentistry.

L.D.S.ENG.

A *Preliminary Science Examination* must be passed, consisting of chemistry, physics, and practical chemistry. This may be studied for prior to registration, but is passed after being registered as a dental student. Fee, 3*l.* 3*s.*

The First Professional is in mechanical dentistry and dental metallurgy, and is taken after the three years' training and six months at a dental hospital and school. Fee, 2*l.* 2*s.*

The Second Professional comes at the end of the four years' curriculum, not less than six months after the first, and the student must be twenty-one years of age. It is written, practical, and oral. The written examination comprises general anatomy, physiology, pathology, and surgery, dental anatomy and physiology, dental pathology, and dental surgery. The oral comprises the same subjects, and is conducted by the use of preparations, casts, drawings, &c. In the practical portion students are examined in dental caries, and may be required to fill cavities, &c.; their knowledge is also tested with regard to the irregularities of children's teeth. Fee, 5*l.* 5*s.* A further 10*l.* 10*s.* is paid for the diploma. Particulars may be had of the Secretary, Examination Hall, Victoria Embankment, W.C.

L.D.S.EDIN.

The requirements are practically the same as in England. There are only two examinations, which are taken subsequent to registration as a dental student. Anatomy, chemistry, physics, and physiology are included in the first examination, the remaining subjects coming under the

THE Dentists Act, 1878, provides for the registration of persons specially qualified to practise as dentists in the United Kingdom, and places in the hands of the General Medical Council the formulating of the scheme of qualification. The Royal Colleges of Surgeons in England, Scotland, and Ireland examine candidates for diplomas. Dental students pass the same Preliminary examination as medical students, and, like them, must register as students with one of the Registrars of the General Medical Council. Candidates for a diploma are required to produce certificates of having been engaged during four years in professional studies, including three years' instruction in mechanical dentistry from a registered practitioner or in some dental hospital. The curriculum includes, as general medical subjects, chemistry, anatomy, physiology, surgery, medicine, and clinical work; and, as special dental subjects, dental anatomy and histology, dental surgery and pathology, dental mechanics, two years' attendance at a dental hospital and three years' instruction in mechanical dentistry. This last requirement can be taken before registration as a student. The following diplomas can be obtained:

Royal College of Surgeons, England.—Dental surgery.

Royal College of Surgeons, Edinburgh.—Dental surgery.

Faculty of Physicians and Surgeons, Glasgow.—Dental surgery.

Royal College of Surgeons, Ireland.—Dentistry.

University of Birmingham.—Bachelor of Dental Surgery.

Several American Universities.—Doctor of Dental Surgery.

The British diplomas all require the curriculum above quoted.

second. Fees, 15*l.* 15*s.* Address: Mr. James Robertson, Clerk to the Royal College of Surgeons, 48 George Square, Edinburgh.

L.D.S.GLASG.

The examinations and fees for this are the same as in Edinburgh. Address: Mr. A. Duncan, B.A., 232 St. Vincent Street, Glasgow.

L.D.S.IREL.

Three examinations are required—namely, *Preliminary* (in general education), *Primary Dental*, and *Final Dental*. The conditions and requirements are essentially the same as the preceding. Fees (exclusive of Preliminary), 21*l.* Candidates whose names are on the *Dentists' Register* are granted the diploma *sine curricula* on passing the Final examination and producing certain certificates as to their practice, skill, moral character, &c.

B.D.S. BIRMINGHAM.

The University of Birmingham grants the degrees of Bachelor and Master of Dental Surgery. Candidates must pass the Matriculation examination required from medical candidates, they must have a licence in dental surgery from some body legally entitled to grant such, and this licence must have been obtained at least twelve months previous to taking the degree, six months of this time being spent in the dental department of a hospital approved by the University. The candidate must also produce evidence that he has attended the following medical courses as required of medical students at the University, and passed the examinations held in the same for medical and surgical degrees: Chemistry, practical chemistry, physics, comparative anatomy, anatomy, physiology. Also that he has attended courses as follows: One course of lectures on medicine, one on surgery, special courses on the surgery and medicine of the mouth, pathology and bacteriology, dental histology, and comparative anatomy, dental surgery and prosthetic dentistry. The examination deals with the above subjects as far as they relate to dentistry. The M.D.S. degree can be taken by thesis twelve months later. The cost of B.D.S. (class and examination fees) is 17*l.* 4*s.* 6*d.*

D.D.S.

This American degree is granted by some universities in the United States. It is not registrable in this country. Those degrees most valued can only be obtained after two years' residence (*i.e.*, two winter sessions) in the case of dentists registered in this country; three years if previously unqualified. The chief value of the degree is that it enables one to obtain practical acquaintance with American dentistry. Some years ago certain American degrees were accepted by the General Medical Council, but this has been stopped. The following are the more important dental schools in the United States, but they are not all connected with the universities:

Harvard University. Address, E. H. Smith, 283 Dartmouth Street, Boston, Mass.

Michigan University Dental College. Address, J. Taft, Ann Arbor, Mich.

Baltimore College of Dental Surgery. Address, Dr. M. W. Foster, 9 West Franklin Street, Baltimore Md.

New York Dental School (University of N.Y.). Address, Dr. C. M. Ford, 218 West 135th Street, New York.

University of Pennsylvania. Address, Dr. E. C. Kirk, Dental Hall, cor. 33rd and Locust Streets, Philadelphia, Pa.

Columbian University. Address, Dr. J. H. Lewis, 1023 Vermont Avenue, N.W. Washington, D.C.

North-Western University Dental School. Address, Dr. W. E. Harper, 146 Franklin Street, Chicago, Ill.

The cost of the curriculum is generally: Matriculation, *£*5; class-fees each year, *£*100; dissecting-fee, *£*10; and diploma-fee, *£*30; besides books and instruments. Board can be obtained at from *£*4 to *£*6 per week in most American cities.

APPROVED DENTAL SCHOOLS.

LONDON.

Charing Cross Hospital, The Medical School, Chandos Street, W.C. Dental curriculum, fifty-five guineas, or sixty-one guineas in instalments. Dean, Mr. H. F. Waterhouse.

Guy's Hospital Dental Department and School, London Bridge, S.E.—Fees for L.D.S.Eng., 110*l.* (or 115*l.* 10*s.* in two instalments), payable on entrance. Dean, Dr. J. Fawcett.

London School of Medicine for Women, 8 Hunter Street, Brunswick Square, W.C.—Classes for dental students. Fee, 60*l.* Laboratory fees, 2*l.* 10*s.*

National Dental Hospital and College, Great Portland Street, W.—The well-appointed bacteriological laboratory offers unusual facilities. Fees for complete curriculum, 43*l.* 1*s.* Dean, Sydney Spokes.

Royal Dental Hospital of London, Leicester Square, W.C.—Fees for dental part of curriculum, 50*l.*, in instalments 52*l.* 10*s.* Single courses may be taken. Dean, Mr. Morton Smale.

PROVINCIAL.

Birmingham.—*University Dental Department*.—Fees, for L.D.S. 60*l.*, and for L.D.S. with degree of B.D.S. 75*l.* (excluding hospital-fees). Dean, Professor B. C. A. Windle.

Dublin.—*School of Dentistry*, 25 Lincoln Place.—Apprentices received, premium 100*l.* Fees for L.D.S.Irel., 81*l.* 18*s.* Acting Dean, Dr. A. W. W. Baker.

Edinburgh.—*Dental Hospital and School*, 31 Chambers Street.—Fees, 74*l.* 12*s.* Dean, Mr. W. Guy, 11 Wemyss Place.

Liverpool.—*University College School of Dental Surgery*.—Apprenticeship premium, 105*l.* Fees for L.D.S., 81*l.* 10*s.* Dean, Professor A. M. Paterson.

Manchester.—*Owens College Dental Department*.—Apprenticeship premium, 105*l.* Fees for L.D.S., 81*l.* 10*s.* Dean, Professor William Stirling, M.D.

Partial tuition in dental subjects or hospital practice may also be received at the following:

Devon and Exeter Dental Hospital, Exeter. Hon. Secretary, Mr. Henry Yeo.

Plymouth Dental Hospital, Bank Street Chambers, Bank Street, Plymouth. Hon. Secretary and Treasurer, Mr. E. A. Bennett.

Glasgow Dental Hospital and School, 5 St. Vincent Street. Address, Mr. D. M. Alexander, 97 West Regent Street, Glasgow.

Institute of Dental Technology and School of Mechanical Dentistry, 4 Langham Chambers, All Souls' Place, London, W. Principal, Mr. George Cunningham, M.A.Cantab., D.M.D. Harvard Univ., L.D.S., R.C.S.Eng.

The following general hospitals also provide hospital practice:

London Hospital and Medical College, Middlesex Hospital, King's College, St. Bartholomew's Hospital and College, St. George's Hospital, St. Thomas's Hospital, University College Hospital, and Westminster Hospital, besides the principal hospitals in the provinces.

Veterinary Surgery.

THE veterinary profession is of very humble origin, but in 1844 a charter was granted to the Royal College of Veterinary Surgeons (10 Red Lion Square, W.C.), which states that the "veterinary art as practised by the members . . . shall be henceforth deemed and taken to be and recognised as a profession." In 1881 the Veterinary Surgeons Act was passed, which placed with the College the power of granting veterinary diplomas, and protected the title. The title clause is as follows:

(1) If after the thirty-first day of December One thousand eight hundred and eighty three any person, other than a person who

for the time being is on the Register of Veterinary Surgeons, or who at the time of the passing of this Act held the Veterinary Certificate of the Highland and Agricultural Society of Scotland, takes or uses the title of Veterinary Surgeon or Veterinary Practitioner, or any name, title, addition, or description, stating that he is a Veterinary Surgeon or a Practitioner of Veterinary Surgery or of any branch thereof, or is specially qualified to practise the same, he shall be liable to a fine not exceeding twenty pounds.

(2) From and after the same day a person other than as in this section mentioned shall not be entitled to recover in any court any fee or charge for performing any veterinary operation, or for giving any veterinary attendance or advice, or for acting in any

manner as a Veterinary Surgeon or Veterinary Practitioner, or for practising in any case veterinary surgery, or any branch thereof.

The Act, however, gives no monopoly of veterinary practice, and it has been decided by the High Court that a chemist may use the title "veterinary chemist."

The regulations made by the Royal College of Veterinary Surgeons require the candidate to pass (1) the Preliminary examination recognised by the General Medical Council, or (2) the Veterinary Preliminary examination of the Educational Institute of Scotland. The examinations are held in London, Edinburgh, Glasgow, and Dublin simultaneously, three times in the year. The examination comprises Latin, mathematics, English, and either Greek, French, German, Italian, or any modern language, and logic. Particulars from Mr. S. M. Murray, 40 Princes Street, Edinburgh. The candidate must next study at a recognised veterinary school for four years, during which time he must pass four professional examinations as follows:

EXAMINATION A.—Anatomy of domesticated animals: bones, ligaments, joints. Chemistry and elementary physics. Biology: elementary zoology and botany.

EXAMINATION B.—Anatomy of domesticated animals. Histology and physiology. Stable management and manipulation of domesticated animals. Principles of shoeing.

EXAMINATION C.—Morbidity anatomy, pathology, and bacteriology. Materia medica, pharmacy, therapeutics, and toxicology. Veterinary hygiene and dietetics.

EXAMINATION D.—Principles and practice of veterinary medicine and surgery. Clinical medicine, surgery, and obstetrics (horse and other domesticated animals). Meat-inspection.

(4) The candidate must be twenty-one years of age when entering for D.

The examinations are conducted by a Board of Examiners, which visits Edinburgh, Glasgow, Dublin, and London towards the end of the College terms (May and December). A fee of 5*l.* for each examination has to be paid to the Royal College at a specified date before the examination, and after the fourth is passed 1*l.* is paid for registration.

The following are the institutions which instruct students for the examinations. It should be noted that these are in no way connected with the Royal College of Veterinary Surgeons, which is an examining and not a teaching body.

Royal Veterinary College (founded 1791; incorporated 1875), Great College Street, Camden Town, London, N.W.—Educational fee, 80*l.*, paid in four instalments, and 2*l.* 12*s.* 6*d.* library fees. There are also fees for occasional students as follows: Anatomy, 8*l.* 8*s.*; botany, 3*l.* 3*s.*; chemistry, 5*l.* 5*s.*; pathology, 5*l.* 5*s.*; physiology, 5*l.* 5*s.*; practical chemistry, 3*l.* 3*s.*; practical histology, 3*l.* 3*s.*; practical pathology, 5*l.* 5*s.*; surgery, 5*l.* 5*s.*; and veterinary medicine, 5*l.* 5*s.* Principal and Dean, Professor John McFadyean, M.R.C.V.S. Secretary, Mr. R. A. N. Powys.

Royal (Dick) Veterinary College (founded 1823), Clyde Street, Edinburgh.—Matriculation and class fees, 58*l.* 16*s.*, in four payments. Prospectus on application. Principal, Professor J. R. U. Dewar, F.R.C.V.S.

The New Veterinary College (established 1873), Leith Walk, Edinburgh.—Matriculation and class fees, 58*l.* 16*s.*, in four payments. Principal, Professor Owen Williams, F.R.C.V.S. The next session begins on October 7, 1903.

Glasgow Veterinary College (established and incorporated 1863), Buccleuch Street, Garnethill, Glasgow.—Fee, 60*l.*, or 63*l.* in instalments. Principal, Professor J. McCall, F.R.C.V.S.

Royal Veterinary College of Ireland, Pembroke Road, Dublin.—Fees, 21*l.* a session, with 1*l.* 1*s.* entrance-fee. Principal, Professor A. E. Mettam, B.Sc.

Holders of the diploma M.R.C.V.S. who have been a certain time in practice may obtain by thesis the title of F.R.C.V.S. Army veterinary appointments are open for competition: commencing salary is 250*l.* a year, with rank of lieutenant, increasing by advancement to 850*l.*—the salary of the principal veterinary surgeon, who holds rank as colonel.

As regards the future of the profession, we are sometimes asked if it is a desirable one, and our answer is that the man who obtains the veterinary qualification has, up to the present time, had no difficulty in obtaining employment on a scale somewhat above that paid to the medical man. There is also less responsibility, as the sacredness of human life does not haunt the veterinary surgeon when he makes mistakes. For the young man who seeks a congenial calling by which to live, but not to make money, the veterinary profession offers perhaps as great inducements as any. Two to four hundred a year, a good horse, and for the most part agreeable work, is the average lot of the vet., but only a few men in special circumstances make large incomes.

COST OF THE CURRICULUM.

From the foregoing, the intending veterinary student will see that the fees amount to 100*l.* at the least, and these do not include any adventitious aids, such as private-coaches' classes. In addition to the college-fee, a student will need for microscope, dissecting instruments, and books, say, another 50*l.* if he is to enjoy any comfort and not waste time by becoming a borrower. It is assumed too readily by most students that the four-years course will see them in possession of the diploma, but a prudent parent or guardian will make an allowance for illness and for failure at one or more of the examinations, which will entail a prolongation of the time during which the student is not in a position to earn anything.

Science.

IT is becoming more and more the practice for pharmaceutical chemists to take a science degree. One reason is that the curricula run for part of the way on parallel lines, and that it is comparatively easy, after the training necessary to become a pharmacist, to acquire the extra subjects. We have indicated on page 311 how such a concurrent curriculum can be managed. Inquiries are constantly addressed to us as to the steps needed

TO BECOME AN ANALYTICAL CHEMIST,

and we shall first proceed to answer this question. It must be stated at the outset that there is no legal restriction to the practice of chemical analysis; anyone who chooses may set up as an analyst. The title "analytical chemist" can only be used in strict law by persons qualified as chemists under the Pharmacy Act, 1868. The practice of analysis, although legally open, is, however, regulated to some extent by

THE INSTITUTE OF CHEMISTRY,

which was founded in October, 1877, and incorporated by Royal Charter in June, 1885, (1) to promote the better education of persons desirous of becoming public and technical analysts and chemical advisers on scientific sub-

jects; (2) to examine candidates, and to grant certificates of competency; and (3) to elevate the profession of consulting and analytical chemistry by setting up a high standard of scientific and practical proficiency, and by insisting on the observance of strict rules in regard to professional conduct.

STUDENTSHIP.—Every candidate for admission to the studentship is required to produce evidence that he is upwards of seventeen years of age, and that he has passed a Preliminary examination, in subjects of general education, recognised by the Council of the Institute.* He must also show that, at the time of making application for registration, he is working at a College or University approved by the Council, or in the laboratory of a Fellow of the Institute. Although at present it is not compulsory for any candidate to register as a student, such registration is advisable in view of the circumstance that a registered student is required to fulfil only those regulations which are in force at the time of his registration.

INTERMEDIATE EXAMINATION.—Candidates for admission to the Intermediate examination are required to produce evidence (1.) of

* A number of examinations in this list are no longer recognised unless passed prior to December 31, 1901, and that of the Educational Institute of Scotland must have been passed prior to December 31, 1902. Full particulars can be had from the Secretary.

having passed an approved Preliminary examination in subjects of general education; (II.) of having regularly attended systematic day courses, in a college or institution recognised by the Council, during at least *three academic years*, in theoretical and practical chemistry, and courses in physics, mathematics, and one of the following subjects, in accordance with the regulations of the Institute: (i.) advanced mathematics, (ii.) mechanics and chemical engineering, (iii.) metallurgy, (iv.) geology and mineralogy, (v.) physiology, (vi.) bacteriology; and (III.) of having satisfactorily passed the Class examinations in all the subjects required to be taken. As an alternative in the matter of training (II.), a candidate may take *two years'* training in a recognised institution as indicated above, and work systematically for *two other years* in the laboratory of a Fellow of the Institute. A candidate who has taken a degree in science, including inorganic and organic chemistry, physics, and mathematics, in a recognised university, is eligible for admission to the Intermediate examination. The examination in theoretical and practical chemistry extends over at least four days. The theoretical part of this examination requires a thorough acquaintance with the fundamental laws of chemistry; with the methods of preparation of the more important elements, and compounds both inorganic and organic; with the principles of chemical classification, and the current theories of chemical science. The practical part may include exercises in qualitative and quantitative inorganic analysis, qualitative and quantitative organic analysis, gas-analysis, preparation of pure materials, physical determinations, the use of the spectroscope, the microscope, the calorimeter, and the polariscope, and other experimental work set forth in the Regulations. At the same time the candidate is required to submit notebooks containing records of the practical work performed by him during the last two years of his training, the contents being taken into account by the examiners in deciding the examination. Holders of certain degrees or diplomas are exempt from passing the Intermediate, and, by virtue of their qualifications, are eligible for admission to the Final examination direct.

EXEMPTIONS.—Candidates may claim exemption from the Intermediate examination:

1. If they have passed any of the following examinations prior to October 1, 1902: B.A. (Honours) at Oxford or Cambridge, in the subject of chemistry; B.Sc. (Honours) in Chemistry, at Dublin, Durham, Edinburgh, Glasgow, Aberdeen, St. Andrews, London, the Victoria University, or the University of Wales; B.Sc. (in Chemistry) in the Royal University of Ireland; the Senior Moderatorship in Experimental Science in the University of Dublin; the Associateship of the City and Guilds of London Central Institute, or of the Royal College of Science (London), in the department of chemistry; the Associateship of the Royal College of Science, Dublin, in the Faculty of Applied Chemistry, together with a certificate that the candidate has spent six months exclusively in the chemical laboratory.

2. If they pass B.Sc. with Honours in Chemistry in the University of London prior to October 1, 1902.

3. If they pass one of the following examinations after October 1, 1902, in the class or division specified: B.Sc. London, with First or Second Class Honours in Chemistry; a First or Second Class in the Final Honour School of Natural Science of the University of Oxford or Cambridge in the subject of Chemistry; B.Sc. with First or Second Class Honours in Chemistry in the Victoria University or the University of Wales; Bachelor of Science, with Special Distinction in Chemistry, in the Universities of Aberdeen, Edinburgh, Glasgow, and St. Andrews; B.A., with B.Sc. or M.A. (involving Inorganic and Organic Chemistry), in the Royal University of Ireland; the Senior Moderatorship in Experimental Science in the University of Dublin; B.Sc. in the University of Durham, or in the University of Birmingham, in the subjects of Chemistry and Physics, the candidate's name being placed in either of the first two Divisions.

4. If they pass the examination for one of the following diplomas (after October 1, 1902), and also an approved Preliminary examination in accordance with the regulations: The Associateship of the City and Guilds of London Central Institute (A.C.G.I.) in Chemistry; the Associateship of the Royal College of Science (Assoc.R.C.Sc.), London, in Chemistry; and the Associateship of the Royal College of Science, Dublin (Assoc.R.S.Sc.I.), in the Faculty of Applied Chemistry, together with a certificate that the candidate has spent an additional six months exclusively in the chemical laboratory of a recognised Institution.

Note.—The regulation requiring associates of the Royal Colleges of Science (London and Dublin) and associates of the City and Guilds of London Institute to pass an approved

Preliminary examination, will not be enforced in the case of those who produce evidence satisfactory to the Council that they entered on a systematic course of training in chemistry at a recognised college prior to July 1, 1902.

FINAL EXAMINATION FOR THE ASSOCIATESHIP (A.I.C.).—Any candidate who has passed the Intermediate examination, or who is entitled to claim exemption from passing the Intermediate examination, is eligible for admission to the Final examination. This extends over at least four days. The candidate is expected to possess, in addition to a general knowledge of all branches of chemistry, a thorough knowledge of one branch of chemistry, to be selected by himself from the following list: (a) Mineral chemistry; (b) metallurgical chemistry; (c) physical chemistry; (d) organic chemistry; (e) analysis of food and drugs and of water, including the examination and analysis of any food or drug within the meaning of the Sale of Food and Drugs Acts, the assay of alkaloids, the recognition of poisonous chemicals and crude drugs, the use of the microscope in the detection of impurities in food, drugs, and water, &c. (candidates are required to show a general knowledge of the therapeutic effects of chemicals and drugs); (f) biological chemistry. In the Final examination the candidate is at liberty to present a thesis upon any chemical subject to which he may have paid special attention, and, if approved, this may be taken as part of the examination. The examiners are at liberty to apply any test which they think desirable in order to obtain evidence as to the knowledge of theoretical and practical chemistry possessed by the candidate.

Any candidate desiring to qualify himself for appointment as public analyst is recommended to take a course of instruction in therapeutics, pharmacology, and microscopy, and to pass the Final examination in branch *c*—viz., the analysis of food and drugs, and of water, including an examination in therapeutics, pharmacology, and microscopy. The examination is conducted on lines approved by the Local Government Boards for England and Wales, Scotland, and Ireland, who accept the certificate of Fellowship or Associateship of the Institute as sufficient documentary evidence of the qualifications requisite for appointment to the office of public analyst.

Intermediate and Final examinations are held each year in January and July, except the Final examination in branch *f*—biological chemistry—which is held in October.

FELLOWSHIP (F.I.C.).—For admission to the Fellowship, an Associate is required to have been registered for three years, and to have been continuously engaged during that period in the study and practical work of applied chemistry in a manner satisfactory to the Council.

Fees.

	£	s.	d.
Student's registration (annual)	0	5	0
Intermediate examination	5	5	0
Final examination	5	5	0
Ditto for those exempted from passing the Intermediate	10	10	0
Fellowship examination	15	15	0
Special examination in therapeutics, pharmacology, and microscopy	2	2	0
Entrance-fee to Fellowship	5	5	0
Fellows' and Associates' annual subscription	1	1	0

It should be noted that in the case of candidates who are registered as students or accepted as candidates for examination before January 1, 1904, a lower scale of fees for examination exists.

Full particulars are given in "The Book of Regulations," published by Messrs. Blundell, Taylor & Co., 173 Upper Thames Street, London, E.C., price 1s. The laboratories and offices of the Institute are at 30 Bloomsbury Square, London, W.C., and communications should be sent to the Registrar (Mr. R. B. Pilcher) at that address.

SCIENCE DEGREES.

The B.Sc. London is the most popular of the degrees in science at present, and under the revised regulations is likely to continue in favour. This and the D.Sc. degree are dealt with in an article on page 313, so that it will be unnecessary to repeat the information here. Full particulars of the examination can be had by addressing the Principal, University of London, South Kensington, S.W.

Other B.Sc.s.

Degrees in science are also granted by the Victoria University, the University of Birmingham, the University of Durham, Aberdeen, Edinburgh, and Glasgow Universities, and the Royal Irish University—the last-named university *sine curriculo*, but the other universities require

attendance at the university classes or other recognised schools for a period of three years in prescribed subjects, a portion of the curriculum (at least one year) being obtained at the university granting the degree. It is also necessary to pass the Matriculation or Entrance examinations in general education of the respective universities, or to produce evidence of having passed a recognised equivalent examination. Some of the universities give a special technical character to their degrees by adapting the requirements to particular occupations—*e.g.*, agriculture, brewing (in Birmingham only), hygiene, engineering, and chemical science.

Further particulars respecting these may be obtained from the universities or affiliated schools mentioned on page 336.

THE BOARD OF EDUCATION

is the Government Department at South Kensington, London, S.W., which is charged with the establishing, conducting, and inspecting of schools and classes which earn grants for science and art education. Such schools and classes are situated in every fair-sized town of the Kingdom, and are an excellent means of getting a foundation of scientific knowledge. Among the subjects taught, and in which examinations are held, are the following :

Geometry, machine-construction, building-construction, applied mechanics, steam, naval architecture, mathematics, theoretical mechanics (solids and fluids), sound, light, and heat, magnetism and electricity, physiography, chemistry (inorganic and organic), metallurgy, geology, mineralogy, human physiology, general biology, zoology, botany, hygiene, agricultural science, and rural economy.

Examinations in all these subjects are held yearly in April and May for the evening classes, and in June for the day classes, and upon the results depend the grants to teachers or institutions, although payments are also made for attendance and equipment. To students who attend twenty-five lessons and pass an examination a certificate is awarded, book-prizes being added in the advanced stages, and bronze medals in the honours stages. Besides, there are awarded annually National scholarships and Free studentships to the best students in each of certain groups, while Royal exhibitions are awarded to those who also obtain a success in advanced practical mathematics, or in the second or some higher stage, or a pass in honours.

A Royal exhibition entitles the holder to an allowance of 50*l.* a year, and free admission to lectures and laboratories and instruction during the three years necessary for completing the Associateship course in the Royal College of Science, London, or the Royal College of Science, Dublin. Seven open each year.

A National scholarship entitles the holder to an allowance of 25*s.* a week for the session of about forty weeks each year, and free admission to lectures and laboratories and instruction during the three years necessary for completing the Associateship course at either the Royal College of Science, London, or the Royal College of Science, Dublin, at the option of the holder. Twenty-one open each year.

A Free studentship entitles the holder to free admission to the lectures and laboratories and to instruction during the three years necessary for completing the Associateship course in the Royal College of Science, London. Six open each year.

Third-class railway-fare is allowed by the Board for one journey to and fro each session, between the home of the Royal exhibitor or National scholar and London or Dublin, as the case may be. Third-class railway-fare is allowed by the Board for one journey to London to holders of Free studentships upon their taking up their Free studentship.

The training in the Royal Colleges of Science is the best of the kind. Local teachers will give inquiring students further information about the matter. The particulars are detailed in the official Directory for conducting schools and classes in connection with the Board of Education, obtainable from Eyre & Spottiswoode, East Harding Street, Fleet Street, London, E.C.; John Menzies & Co., 12 Hanover Street, Edinburgh, and 90 West Nile Street, Glasgow; or Hodges, Figgis & Co. (Limited), 104 Grafton Street, Dublin—price: Part I, 2*d.*; Part II, 4*d.* (the second part gives schedules of subjects).

CITY AND GUILDS OF LONDON INSTITUTE.

The most typical establishments for technical education in this country, and the first in the field, are the Central Technical College, Exhibition Road, S.W., and the Technical College, Leonard Street, Finsbury, E.C. These are supported

by the Ancient Corporations and the City of London, and were founded in 1878 under the title of "City and Guilds of London Institute." The head offices are Gresham College, Basinghall Street, E.C. The College in Exhibition Road is for higher instruction of a university character in mechanics and mathematics, civil, mechanical, and electrical engineering, and chemistry. The curriculum extends over three years, and a Matriculation examination is required on entering. The following description of the chemical course gives a fair idea of a typical curriculum in chemistry :

First Year.—Daily lectures and practice in chemistry, physics, mathematics, engineering drawing, laboratory of mechanics, and engineering workshop.

Second Year.—Daily lectures and practice in chemistry, engineering, crystallography, and engineering design.

Third Year.—Students spend one day per week during the winter term in either the civil and mechanical engineering or electrical engineering department. They attend the courses on crystallography and physical chemistry, which last throughout the session, and, if desirable, also a mathematics class. The remaining time is spent in the chemical laboratory. As soon as students have acquired the necessary proficiency as analysts and sufficient skill in preparing pure substances, they are encouraged to undertake an original investigation.

The Finsbury College is an intermediate one, in which courses of day instruction are arranged in mechanical and electrical engineering and chemistry, and evening-classes in the same subjects and in applied art.

The Institute also has an art school in Kennington Park Road, and holds technological examinations throughout the provinces yearly.

Most university colleges in the country also have definite curricula for science students, and grant an associateship to those who qualify by passing the requisite examinations.

METROPOLITAN SCIENCE SCHOOLS.

CENTRAL TECHNICAL COLLEGE, Exhibition Road, S.W.—There are three diploma courses: (1) Civil and mechanical engineering, (2) electrical engineering, (3) chemistry. The fees for the courses amount to 30*l.* a session. For prospectuses and information apply to the Dean.

TECHNICAL COLLEGE, Leonard Street, City Road, E.C.—The course extends to two years, except in the case of applied chemistry, which occupies three years, the fees being 15*l.* a session. Evening classes are held at moderate fees. Communications are to be addressed to the Principal.

UNIVERSITY COLLEGE, London, Gower Street, W.C.—Faculty of Science. Session 1903-4 begins on October 6. The tuition fees for a complete three-year course for B.Sc. amount to about 105 guineas. Practical chemistry 26*l.* 5*s.* per session. Secretary, T. Gregory Foster, Ph.D.

KING'S COLLEGE, Strand, W.C.—Fees are about the same as at University College. Evening classes are held.

CITY OF LONDON COLLEGE, White Street, Moorfields, E.C.—Evening classes in all science subjects; fees for members 4*s.*, for non-members 1*s.* per course of lectures; the course extends from October to May. Laboratory practice is 17*s.* and 20*s.* for ordinary courses. Special courses for University of London, Conjoint Board, and Pharmaceutical examinations. Fees for members (lectures and laboratory practice) from 25*s.*, for non-members from 30*s.* per course from October to June.

Evening classes in science subjects suitable for the Minor and B.Sc. are held at the Polytechnic, Regent Street, W.; the Polytechnic Institute, Borough, S.E.; the People's Palace, Mile End Road, E.; the Northern Polytechnic, Holloway, N.; Technical College, Chelsea; the Carpenters' Institute, Stratford, E.; Goldsmiths' Company's Technical and Recreation Institute, New Cross, S.E.; Birkbeck Institute, Bream's Buildings, Chancery Lane, E.C.; and West Ham Technical Institute, Romford Road, Stratford. The education provided at these institutions is exceptionally good, some of them specially catering for chemists' assistants.

PROVINCIAL SCIENCE SCHOOLS.

ABERYSTWYTH.—*University College of Wales.*—Composition fee for the science course, 10*l.* per session, with extra fees for practical work. Registrar, Mr. T. Mortimer Green. A hostel for men students has just been opened.

BANGOR.—*University College of North Wales.*—Terms as at Aberystwyth. Secretary and Registrar, Mr. J. E. Lloyd.

BARROW-IN-FURNESS.—*Technica' Schools, Abbey Road.*—Evening classes in science, art, and technology. Secretary, Mr. C. F. Preston, Town Clerk.

BELFAST.—*Queen's College*.—There is a science division of the Faculty of Arts where instruction for science degrees of the Royal University Ireland can be had. The fee for each course is generally 2*l.* Registrar, Dr. Johnson Symington, F.R.S.

BIRMINGHAM.—*University*.—Courses are conducted in physics, chemistry, metallurgy, and botany. The lecture-fees in chemistry are 1*l.* 11*s.* 6*d.* to 5*l.* 5*s.* per course. Laboratory fees from 2*l.* 12*s.* 6*d.* per course.

Municipal Technical School, Suffolk Street.—Evening classes. Lecture-fees 2*s.* 6*d.*, laboratory 5*s.* per subject. Secretary, Mr. George Mellor.

BRADFORD.—*Municipal Technical College*.—Has departments of chemistry, physics, biology, botany, and other pharmaceutical subjects, civil, mechanical, and electrical engineering, in which day and evening classes are held. Secretary, Mr. John Nutter.

BRISTOL.—*University College*.—The fees for the science classes are moderate, and courses are arranged for the examinations of the London University. An evening course is held for the Matriculation. Principal, Professor C. Lloyd Morgan, LL.D., F.R.S. Registrar and Secretary, Mr. James Rafter.

CARDIFF.—*University College of South Wales and Monmouthshire*.—Fees for science classes, 13*l.* 13*s.* per session. Registrar, Mr. J. A. Jenkins.

CORK.—*Queen's College*.—Similar to Belfast. There are eight scholarships, two of which are allocated to each of the first four years, are each of the value of 25*l.*, and that in the fifth year there is the Blayney scholarship of the value of about 35*l.* and a Senior Exhibition of the value of 30*l.* Registrar, Mr. Alexander Jack.

DUBLIN.—*Royal College of Science*.—The course of instruction is similar to that in the London Royal College, but the fees are lower. Government scholarships are also held here.

DUNDEE.—*University College*.—Botany, chemistry, and physics are taught in day classes, and chemical technology in the evening at the Technical Institute. Secretary, Mr. R. N. Kerr.

EDINBURGH.—*Heriot-Watt College, Chambers Street*.—Day and evening classes are held in all science subjects. Chemistry day lectures, 4*l.* 4*s.* per session, including laboratory. Complete three-year course in manufacturing chemistry: First year,

12*l.* 12*s.*; second year, 12*l.* 12*s.*; third year, 15*l.* 15*s.* Principal, A. P. Laurie, M.A., D.Sc., F.R.S.E.

The *University* science course extends to three years, and there are splendid laboratories.

GLASGOW.—*University*.—The fees in the Faculty of Science are 3*l.* 3*s.* or 4*l.* 4*s.* a class, except for laboratory instruction, which is 10*l.* 10*s.* in the chemical, physiological, and engineering sections, and 6*l.* 6*s.* in the physical department.

Technical College.—Day and evening classes are held. Courses of study during the day, extending over three years, in such subjects as chemistry, applied chemistry, mechanical and electrical engineering, have been arranged. The fees for the first year are from 10*l.* 10*s.* to 15*l.* 15*s.*, and for the second and third years from 13*l.* 13*s.* to 18*l.* 18*s.* The fees for the evening classes are from 2*s.* 6*d.* upwards. Secretary, Mr. H. F. Stockdale, 38 Bath Street, Glasgow.

LEEDS.—*Yorkshire College, Victoria University*.—The instruction is adapted to the Victoria University degrees and various diplomas. There are special classes for diplomas in public health. Secretary, Mr. W. F. Husband, LL.B.

LIVERPOOL.—*University of Liverpool*.—Instruction for degrees in science. For pharmacy prospectus apply to the Registrar, Chevalier Londini, D.C.L. Secretary, P. Hebblethwaite, M.A.

NEWCASTLE-UPON-TYNE.—*Durham College of Science*.—Fees for curriculum of B.Sc. Durham 56*l.* Day and evening classes are held. Secretary, Mr. F. H. Pruett.

NOTTINGHAM.—*University College*.—Day and evening science lectures are given, a special pharmaceutical course is arranged at fees from 5*s.* a course each subject. Secretary, Mr. P. H. Stevenson.

PLYMOUTH.—*Municipal Science, Art, and Technical Schools*.—Day and evening classes are held in most science subjects, the next term commencing on September 12. Secretary, Mr. E. Chandler Cook, 18 Princess Square, Plymouth.

SHEFFIELD.—*University College*.—Day and evening lectures in most science subjects are given at low fees, also practical instruction.

WOLVERHAMPTON.—*Municipal Science and Technical School*.—Special arrangements in physics, mathematics, and chemistry are made for students preparing for the Inter. B.Sc.

Prizes and Positions.

THE following notes indicate the scholarships and prizes available for pharmaceutical students. There are in addition at most of the schools of pharmacy awards of medals and certificates, particulars of which are contained in the respective prospectuses.

The Jacob Bell scholarships were founded by subscription in memory of the founder of the Pharmaceutical Society. Two Bell scholarships are awarded annually as the result of examinations held on the third Tuesday in June in London, Edinburgh, and Manchester. The scholarships are worth 30*l.* each, but in addition free laboratory instruction and admission to the lectures at the Society's School are granted, and the Thomas Hyde Hills fund provides 5*l.* worth of books, the books being divided between the two scholars. Candidates are examined in Latin, French, or German, English, arithmetic, botany, chemistry, and pharmacy. There is generally a keen competition, and a revision of the subjects so as to make the examination harder has been suggested. Particulars are obtainable from the Secretary of the Society.

The Manchester Pharmaceutical Association scholarship is similar in value to the Bell scholarship, but the instruction can be taken in any provincial school approved by the Council of the Society—Owens College, Manchester, for instance. Candidates must have passed not less than three years with a chemist in Lancashire, Cheshire, or the High Peak parliamentary division of Derbyshire.

The Research Laboratory of the Pharmaceutical Society was instituted in 1888 for the purpose of furthering pharmaceutical research. Workers do not receive payment, and must satisfy the committee of management of their competency to undertake original investigation. Work is done in the laboratory at the suggestion of the Pharmacopœia Committee of the General Medical Council, from whom small grants are received.

The Salters' Company offer, through the Pharmaceutical

Society of Great Britain, a "Fellowship" worth 100*l.* a year, tenable in the Research Laboratory.

The Redwood Scholarship is maintained by a fund raised at the retirement of the late Dr. Redwood. This year Mr. Carteighe has more than doubled the invested capital as a result of a canvass amongst Dr. Redwood's old pupils. The scholarship was formerly awarded annually, but, being of small amount, was not sufficiently tempting to Major men. It is now to be awarded biennially, and is of the value of about 80*l.*

The Burroughs Scholarship is, like the Redwood Scholarship, for the encouragement of pharmaceutical chemists in original investigation in chemistry and chemical pharmacology. It is now awarded biennially, and is of the value of 50*l.*

Pharmaceutical chemists are also entitled, under certain conditions, to compete for the Pereira medal, and student-associates may compete for the herbarium prize.

The Pharmaceutical Society of Ireland gives a gold medal and a silver medal to the best two candidates of the year at the Licence examination, a minimum of marks required being fixed.

The British Pharmaceutical Conference has a research fund available for grants in aid of research. Applications should be addressed to the Secretaries, the British Pharmaceutical Conference, 17 Bloomsbury Square, W.C.

ARMY COMPOUNDERS.

These appointments are held by non-commissioned officers in the Royal Army Medical Corps, who pass examinations in pharmacy, materia medica, posology, and similar subjects conducted by the medical officers. It is necessary to enlist in the corps, and work up to the position through the usual stages, which include drill, nursing, field-work, and the like. The positions do not offer any attractions to qualified chemists. During the Boer war a number of temporary

appointments of dispensers was made for a year or the period of the war at the pay of 3s. 6d. a day, free rations, kit, and passage to and from South Africa.

DISPENSERS IN NAVAL HOSPITALS.

There are sixteen dispenserships in naval hospitals at home and abroad—four and a supernumerary at Haslar, three at Plymouth, two at Malta, and one each at Haulbowline, Chatham, Cape of Good Hope, Jamaica, Bermuda, and Hong-Kong. Entry into the Service is by examination, conducted by the Civil Service Commissioners, but the candidates are first selected by the Medical Department of the Navy, Northumberland Avenue, W.C., to the Director-General of which department applications respecting vacancies and nominations should be addressed. Candidates must be chemists and druggists or pharmaceutical chemists, and be not less than twenty-one or more than twenty-eight years old. The pay is 110*l.* a year to begin with, and rises by 5*l.* every two years to 130*l.*, and then by 10*l.* every two years to 230*l.* Additional allowances of from 20*l.* to 40*l.* a year are made to dispensers in charge of stores. Free quarters are provided, and allowances made to those serving on foreign stations to meet the increased cost of living. Dispensers get a month's holiday yearly, and those on foreign stations may reserve their holiday from year to year so as to obtain a longer period of absence, but *locum tenentes* have to be found "without putting the public to any expense in providing substitutes." Pensions are granted on retiring.

Vacancies are advertised in THE CHEMIST AND DRUGGIST when they occur. The examination (fee 10*s.*) is held on the Pharmaceutical Society's premises in (1) pharmaceutical chemistry; (2) *materia medica*, including the British Pharmacopœia and its Appendix, poisons and their antidotes, dosage of remedies, and preparation of antiseptic solutions; (3) recognition of chemicals and drugs employed in medicine; and (4) practical pharmacy, prescription-reading, and detection of errors in doses. 3 and 4 are *vis à voce* subjects.

The following is the official syllabus:

1. *Pharmaceutical Chemistry*.—The range of the examination extends to the following subjects: The sources of drugs; the adulteration of drugs; the active principles of drugs; the principles of dosage; the principles of dispensing; flavouring-agents; incompatibility and antagonism; idiosyncrasy, toleration and habit, accumulation; weights and measures, including the metric system. 2. *Materia Medica*.—The range of the examination is indicated in the following schedule: (a) *Inorganic Substances*: The physical and chemical characters, preparations, actions, and doses of chlorine, chlorinated lime; bromine and the bromides; iodine and the iodides; sulphur, sulphurous acid, and the sulphides; phosphorus, the phosphates, and the hypophosphites; the mineral and vegetable acids; potassium salts, including the bicarbonate, chlorate, and permanganate; sodium salts, including the bicarbonate and sulphate; ammonium salts, including the carbonate, chloride, and acetate; lime, carbonate of lime; magnesia, sulphate of magnesium; alum; zinc, oxide and sulphate; sulphate of copper; nitrate of silver; mercury and its salts; lead, acetate and subacetate; antimony; arsenic; hydrocyanic acid; bismuth; iron. (b) *Synthetical Compounds*: The physical and chemical characters, mode of administration or application, actions and doses of alcohol, including percentage of, in wines, spirits, &c.; anæsthetics, including chloroform, ether, and "A.C.E." mixture; antiseptics, including carbolic acid, creosote, salicylic acid, &c.; the salicylates; iodoform and its substitutes; chloral and butyl-chloral-hydrate; sulphonal and its congeners; nitro-glycerin and nitrite of amyl. (c) *Drugs of Vegetable Origin*: The source, physical characters, preparations, actions, doses, and uses of aconite; opium and its alkaloids, apomorphine; coca and cocaine; jaborandi and pilocarpine; physostigma and eserine; the tonic bitters, such as gentian, quassia, and calumba; cinchona-bark and its alkaloids; nuxvomica and strychnine; the belladonna group, including the alkaloids and derived alkaloids; digitalis and strophanthus; Indian hemp; ipecacuanha and senega; squill; purgatives, such as castor oil, croton oil, aloes and aloin, elaterium and elaterin, jalap, rhubarb, and senna; tannic acid, gallic acid, kino, catechu, and hamamelis; camphor, turpentine, menthol; copaiba and cubeb; colchicum; male fern, santalin, and other anthelmintics; ergot. (d) *Drugs of Animal Origin*: Cod-liver oil; cantharides, and the preparation of blisters and blistering-fluids. 3. *Poisons*.—The symptoms produced by the commoner poisons; the modes of evacuating the contents of the stomach; emetics and their mode of administration; antidotes and their mode of preparation. 4. *Recognition of Chemicals and Drugs*.—This will be confined to those commonly employed in medicine. 5. *Practical*

Pharmacy, &c.—In the practical examination the candidate may have to dispense mixtures, pills, suppositories, &c., and to spread plasters. He must be able to dispense percentage solutions. Quickness, accuracy, and neatness will be taken into consideration.

These appointments, which are limited, are in naval hospitals; in the Navy itself the dispensing is done by the medical officer or by a bluejacket trained by him.

POOR-LAW DISPENSERS.

These are appointments made by Guardians of the Poor to dispensaries in metropolitan Unions and other Unions where special orders of the Local Government Board are in force. A candidate must be either (1) a Licentiate of the Society of Apothecaries, London; (2) an apothecary's assistant (under the Apothecaries Act); (3) a compounder of medicines in accordance with the Regulations for the Army Medical Staff Corps; (4) registered under the Pharmacy Act, 1868; or (5) an Irish pharmaceutical chemist. A dispenser's salary can be increased by 10*l.* every fourth year until a maximum of 180*l.* a year is reached. Poor-law dispensers come under the provisions of the Poor-law Officers' Superannuation Act, 1895, and receive pensions on retirement through age or ill-health at rates laid down in the Act.

PRISON DISPENSERSHIPS

are open to chemists and druggists between twenty-four and thirty years of age. It is necessary to join as a warder and wear uniform. Residence is provided, and the salary is from 105*l.* to 140*l.* a year.

ANALYTICAL APPOINTMENTS.

WOOLWICH LABORATORY.—For the position of junior assistant in the department of the War Office Chemist at Woolwich an examination in chemistry and physics is held. Chemistry comprises inorganic and organic chemistry, including the more important methods of analysis. The examination is written and practical. In physics the more elementary portions of the subject, including the general properties of matter, heat, light, sound, electricity, and magnetism, are included.

GOVERNMENT LABORATORIES, Clement's Inn Passage, Strand, W.C. (formerly Somerset House).—Applicants for appointments in these laboratories were formerly required to be assistants of Inland Revenue or junior officers of the Customs Department; but the Principal Chemist now has considerable discretion as to the appointments, and well-qualified men who are not Revenue officers are frequently selected. The salary of second-class analysts is 160*l.*, increasing by 15*l.* annually. Particulars of the examination (which others than those selected by the Principal must pass) can be had from the Secretary of the Civil Service Commission, Cannon Row, S.W. After passing the examination, a two-years course in theoretical and practical chemistry is provided, with certain allowances, at the Royal College of Science, South Kensington. The pay of Government analysts varies from 160*l.* to 800*l.*, with pension on retirement.

OPTICAL EXAMINATIONS.

The fitting of spectacles is now a well-recognised part of the chemist's business, and, it may be added, not the least remunerative. Examinations in optics are held as under, and many chemists go in for the diplomas as a tangible proof of their abilities in spectacle-fitting. The diplomas do not confer any legal status on the holders. It may be mentioned, however, that whilst the practice of optics is open to all, efforts are being made in some quarters to promote a Bill in Parliament to regulate the trade, but it must be years before such a measure can become law. Following the practice adopted in such cases, steps would have to be taken to register spectacle-vendors at the time of the passing of the Act.

THE SPECTACLE-MAKERS' COMPANY, London, hold examinations about twice a year, usually in February and November. There are two grades—the Full course and the Modified. The modified examination can only be taken by those who

have been trading for at least seven years. The subjects of the examination are:

LIGHT.—Elementary laws of light; simple laws of refraction; the index of refraction; refraction as applied to lenses and prisms; conjugate foci; formation of images; simple laws of reflexion as applied to curved and plane mirrors.

OPTICS RELATING TO VISION.—General anatomy of the human eye. The course of light passing through the media of the eye alone and modified by spherical and cylindrical lenses and prisms. Hypermetropia; myopia; astigmatism; presbyopia. Instruments commonly used for determining the refraction of the eye: Trial lenses—test types—astigmatic chart—the optometer. The principle of the ophthalmoscope. The principle of, and various forms of spectacles.

PRACTICAL WORK IN VISUAL OPTICS.—Testing a plane surface; measurement of focal length of spherical, cylindrical, and compound lenses; use of the spherometer or lensmeter; measurement of conjugate foci; determination of the axis of a cylinder, and the angle of deviation of a prism; analysis and neutralisation of spherical, cylindrical, and compound lenses, and lenses combined with prisms; transposing; centring and adjustment of spectacle lenses and frames; face-measurement for spectacles. Knowledge of the materials and of the workmanship employed in the manufacture of lenses and frames; use of pebble-tester. Reading of oculists' prescriptions; giving out orders for lenses and frames.

Candidates who take the Full examination are examined, as well, in elementary mathematics, heat, practical work with optical and mathematical instruments, and in either the photographic camera or the microscope. There has been but little alteration in the regulations during the year, but a committee is at present considering the desirability of adding sight-testing to subjects in which candidates are examined.

The Full examination can be taken in two parts. The examination-fee is 3*l.* 3*s.* The company issue a booklet to medical men containing a list of those opticians who hold their diplomas. Further particulars can be had from Col. T. Davies Sewell, 11 Temple House, Temple Avenue, E.C.

THE BRITISH OPTICAL ASSOCIATION, 17 Shaftesbury Avenue, W., have also an examination-scheme. In the B.O.A. scheme there are three grades of examination—the optic, dioptric, and fellowship—for which the fees are 1*½*, three, and five guineas. The optic grade has to be passed by the candidate before he can pass to the higher grades. The examinations are held twice yearly in London. Candidates must be of British nationality. A new syllabus has just been issued, and the Association offer (for a small fee) to register opticians. The Secretary is Mr. J. H. Sutcliffe.

OPTICAL INSTRUCTION.

THE NORTHAMPTON INSTITUTE, Clerkenwell, E.C.—At this institute a course of optical lectures and practical instruction, subsidised by London opticians and by public bodies, is held. The course begins in October, and lasts till June of the following year. The facilities for acquiring optical instruction at this institute are exceptional. Particulars can be had from Dr. R. Mullineux Walmsley, the Principal.

MR. LIONEL LAURANCE, 326 Birkbeck Bank Chambers, Holborn, W.C., conducts correspondence and personal classes in visual optics in preparation for the examinations of the Worshipful Company of Spectacle-makers. The fee for the course is 8*l.* 8*s.* Also classes in sight-testing and advanced practical work.

THE ANGLO-AMERICAN OPTICAL COMPANY, 47 Hatton Garden, E.C., conduct a school of optics.

Pharmaceutical Society of Ireland.

THE monthly meeting of the Council was held on August 5 at 67 Lower Mount Street, Dublin. The President (Mr. George Beggs) presided, and the other members of Council who attended were Messrs. Wells, Vincent Johnston, Brown, David M. Watson, Professor Tichborne, Kelly, and Smith.

THE NEW COUNCILLOR.

A letter was read from Mr. David M. Watson thanking the Council for having co-opted him a member.

The PRESIDENT welcomed Mr. Watson, and said he was sure from what he knew of him that he would make a useful member of the Council.

MR. WATSON thanked the President and Council for the honour conferred on him, and for the gracious welcome they

had given him. In putting him in the place of the late Mr. Grindley they had planted a veritable sapling in the room of a mature and fruit-bearing tree. He hoped they would bear with the sapling until it matured and showed whether it was capable of bearing useful fruit or not. Of course, if it should not they would have the periodical opportunity of digging it up and casting it forth.

THE KING AND THE COUNCIL.

THE PRESIDENT reported that Mr. Wells—who accompanied him in the unavoidable absence of the Vice-President—and he attended at Dublin Castle on the day on which the King held his Court there and personally presented the Council's address to his Majesty. The King's general reply to it and a number of other addresses was as follows:—

Ladies and Gentlemen,—I accept with sincere gratification your loyal assurances of devotion to my throne and person, and I thank you for the hearty greeting which you tender to the Queen and myself on our first visit to Ireland since my accession. I rejoice to hear of the newly awakened spirit of hope and enterprise among my Irish people which is full of promise for the future. It will be a source of profound happiness if my reign shall be coincident with a new era of social peace and of industrial and commercial progress in every part of Ireland. I regret my inability to make an individual acknowledgment to each of the bodies that have taken part in this demonstration of good will to myself and my family, but I recognise that the manifold activities of Irish life are very fully represented here. I ask you to accept from the Queen and from myself an assurance of deep sympathy with you and with your fellow workers in the cause of religion and philanthropy, of art and science, of industry and commerce, as well as in the important work of local government. I pray that the Divine blessing may rest abundantly on your varied labours for the benefit of the community and for the elevation of the national life.

CORRESPONDENCE.

A letter was read from the Irish Privy Council enclosing a copy of an order approving of the addition which the Council of the Society had made to the Regulations, requiring from candidates at the Preliminary examination "a competent knowledge of grammar" in every language in which they should be examined.

A letter was read from Mr. D. S. Jardin thanking the Council for having unanimously elected him one of their examiners.

THE PRESIDENT: I think we have been very happy in our choice of Mr. Jardin, especially as he is a member of the Society.

EXAMINATORY MATTERS.

The reports of the examiners at the July examinations were laid on the table. From these it appeared that at the Preliminary examination eleven candidates passed, twelve were rejected, and two were absent; that at the Licence examination ten passed and eighteen were rejected; that at the Dublin examination for Registered Druggists three passed, and three were rejected; that at the Belfast examination for Registered Druggists four passed, and three were rejected; and that at the examination for Pharmaceutical Assistants three passed and one was rejected.

THE PRESIDENT moved that in future the Preliminary examinations should be held on the first Thursday and following day in January, April, July, and October, instead of the first Tuesday and following day in each of those months as at present. The object of this was to prevent the Preliminary and Licence examinations from clashing.

The motion was unanimously agreed to.

THE B.P.C.

THE PRESIDENT stated that he and Mr. Wells attended as delegates from the Council at the British Pharmaceutical Conference, and they had three other Irish gentlemen over with them to the Conference. It was a very successful one, and the delegates and members of the Society who attended it were very heartily welcomed and cordially treated.

NEW MEMBERS.

The following gentlemen were elected members of the Society: Mr. David Rea, Mitchelstown; Mr. R. J. Savage, Dublin; Mr. J. P. E. Wright, Balbriggan, co. Dublin; and Mr. R. J. Eccles, Belturbet, co. Cavan.

Other business having been disposed of, The Council adjourned.

New Companies & Company News.

DARBY'S OINTMENT (LIMITED).—Capital 5,000*l.*, in 1*l.* shares. Objects: To acquire the undertaking, a secret process for the preparation of an ointment, and certain other assets of J. G. S. Darby, and to carry on the business of ointment, medicine, and drug manufacturers and vendors, chemical-manufacturers, chemists, druggists, druggists' sundriesmen, &c. The first subscribers are: J. Warren, 63 Camberwell Grove, S.E., clerk; G. S. Philpott, 5 Edna Street, Battersea Park, accountant; H. G. Peters, 134 High Road, Lee, clerk; G. Butts, 18 York Road, Leyton, clerk; A. G. Harrison, 109 Victoria Road, Wood Green, N., clerk; G. E. Saunders, 11 Suffolk Street, Rotherhithe, S.E., clerk; and R. E. F. Gray, 51 Brunswick Close, St. John Street Road, E.C., clerk. No initial public issue. The first directors are W. R. H. Merk (chairman), J. G. S. Darby, and Isabel G. McAllister (all permanent; special qualification, one share). Qualification of subsequent directors, 200*l.* Registered office, 86 Cannon Street, E.C.

GYPTICAN OIL COMPANY (LIMITED).—Capital 10,000*l.*, in 1*l.* shares. Objects: To acquire the business of the Gypstican Oil Company, now carried on by Ella M. Geddes and Daisy E. Capon at 17 Farringdon Avenue, E.C., with all or any of the recipes for manufacturing and the right to manufacture and deal in a medicinal preparation known as "Gypstican oil" and to carry on the business of medicine and drug manufacturers and dealers, chemists, chemical manufacturers, drysalters, &c. The first subscribers are: A. M. Jackson, Church Lane, Edgware; H. J. Dent, 3 Bank Buildings, Sidcup, photograver; R. C. Boscastle, Elm Road, Richmond, photographer; C. West, 24 River Street, Pentonville, E.C., traveller; E. E. Finbow, 122 New Kent Road, S.E., clerk; A. Dale, 10 Ravenna Road, Putney, S.W., clerk; and W. R. Danzey, 89 Evershot Road, N., tailors' salesman. No initial public issue. The first directors are Ella M. Geddes and Daisy E. Capon (both permanent). Qualification (except first directors) 100*l.* Registered office, 17 Farringdon Avenue, E.C.

C. F. PALMER & Co. (LIMITED).—Capital 2,000*l.*, in 1*l.* shares (1,000 10 per cent. cumulative preference). Objects: To acquire the business of chemists and druggists formerly carried on at Temple Row, and more recently at the Minorities, Birmingham, by W. E. Gould and W. S. Bridgwood, under the style of "C. F. Palmer & Co.," and to carry on the business of chemists, druggists, herbalists, opticians, druggists' sundriesmen, manufacturers of photographic and scientific apparatus, dealers in sensitised, albumenised, and other papers and cloths, &c. The first subscribers are: P. Cohen, 7 Waterloo Street, Birmingham, solicitor; C. Cook, 483 Park Road, Soho, Birmingham, law clerk; G. L. Knott, 90-5 Lord Street, Birmingham, incorporated accountant; W. H. Winder, 19 Ivor Road, Sparkhill, Birmingham, law clerk; E. Cotton, 10 Oakfield Road, Balsall Heath, bookbinder; W. S. Bridgwood, 25 Bristol Road, Bournbrook, chemist; and W. E. Gould, 210 Soho Hill, Handsworth, chemist. No initial public issue. The first directors are G. Knowles (chairman), and A. T. Hall; qualification 100*l.*; remuneration as fixed by the company. Registered office, 52 Cherry Street, Birmingham.

SALE OF SHARES.—At Sheffield on August 11, 400 Boots' Pure Drug Company's "C" pref. shares were sold at 22*s.* 9*d.* each, 120 Boots' Chemists pref. (Western) at 22*s.* 9*d.* each, 46 Boots' Chemists pref. (Southern) at 22*s.* 9*d.* each, and 16 Boots' Chemists pref. (Lancashire) at 22*s.* 7½*d.* each.

TREACHER & Co. (LIMITED), BOMBAY.—In the report for the year ended March 31, the Board of Directors regret that the accounts show practically no profit on the year's working. After the unsatisfactory result of the working for the previous year, the directors deemed it necessary to have a very searching examination made, especially of the stock-books. The result of this investigation has shown that probably from the earliest years of the company's working an erroneous system has prevailed of rates being carried from stock-book to stock-book without due reference to current invoice cost. Errors also were found in the extensions in the value of stock, and sufficient allowance had not been made for deteriorated stock. The manager, by instructions from the board, prepared very complete statements, and the directors desire to acknowledge the great care which the auditors have bestowed on these special inquiries in addition to the usual audit. The result has been that errors and omissions, as above stated, have been discovered and have now been rectified, but the profits of a fair year's trading have been absorbed in doing so. The directors desire to state that the alteration in the manner of conducting the business of the company at home which has been

made during the year has proved very satisfactory, and has resulted in a considerable saving. They have also to record a reduction in the working expenses of the company in India. Coupled with these and the increase of the company's business during the year under report, they consider the prospects for the future to be hopeful. Under these circumstances the directors recommend that the sum of Rs. 40,000 be withdrawn from the reserve fund to enable a dividend of Rs. 20 per share to be paid. It is for the shareholders to say if they approve of this course.

Personalities.

MR. S. K. ELGIE, chemist and druggist, Durban, who has been home on a three-months' holiday, sailed for South Africa on August 8 on board the s.s. *Walmer Castle*.

PHARMACISTS all over the world will be pleased to learn that the operation which Dr. Attfield has recently undergone has been entirely successful. Gastro-enterostomy was performed by Mr. Lockwood, on July 30, and although sixty-eight years of age, Dr. Attfield is making a satisfactory and rapid recovery.

On the occasion of the jubilee celebrations at Heidelberg University on August 8 honorary degrees were conferred on Sir William Ramsay, Mr. Henry Bradley, President of the Philological Society, Professor Lindsay, of St. Andrews University, Professor Richard Glazebrook, director of the National Physical Laboratory at Richmond, and Sir William Huggins, President of the Royal Society.

MR. S. B. BULTON (of Burt, Bulton & Haywood, Limited, manufacturing chemists, 64 Cannon Street, E.C.) is Chairman of the London Labour Conciliation and Arbitration Board. A paper by Mr. Bulton presented to the Industrial Conference (held under the auspices of the Labour Co-partnership Association and the London Labour Conciliation and Arbitration Board) at the Crystal Palace in July, 1903, has been printed, and is now being issued in pamphlet form by the London Chamber of Commerce. It is a strong and rational appeal for greater co-operation between capital and labour.

Westminster Wisdom.

(From our Parliamentary Representative.)

SHEEP-SCAB BILL.

This Bill, which has for its object the stamping-out of sheep-scab, and proposes to make sheep-dipping compulsory, passed the second reading in the House of Lords on August 12. The Bill confers power on the Board of Agriculture to issue orders for the compulsory dipping of sheep. The Earl of Onslow explained that it is not the intention of the Board to specify any dip until the Committee now sitting have reported. The Duke of Northumberland thought the Bill would cause the maximum of annoyance with the minimum amount of good; and perhaps the Duke had in mind the evil of conferring on an easily influenced Government department such powers as are proposed in the Bill.

THE CURTAIN FALLS.

The Session has come to an end, and members are scattering to the four winds. The list of measures to which the Royal assent has been given does not contain any names in which your readers are particularly interested. With respect to some, at least, this will not excite vain regrets, for few tears will be shed over the demise of the Pharmacy Bill. The Prevention of Corruption Bill was kept on the agenda-paper to the last; but, though Mr. Channing and others pleaded on Monday that efforts should be made to pass it, it was not destined to survive the opposition it excites in certain quarters.

ALKALI.

Mr. Walter Long introduced, on Wednesday, a Bill to consolidate and amend the Alkali-works Regulation Acts, 1881 and 1892. The Bill was merely read a first time; but we may expect to hear more of it next Session.



TO CORRESPONDENTS.—Please write clearly and concisely on one side of the paper only. All communications should be accompanied by the names and addresses of the writers. If queries are submitted, each should be written on a separate piece of paper. We do not reply to queries by post, and can only answer on subjects of general interest.

Citral in Lemon Oil.

SIR.—I inadvertently omitted in my letter on the above subject last week to draw attention to the fact that the greatest factor in forcing on the honest treatment of lemon-oil guarantees is the prolonged and invaluable work of Burgess and Child. It was they who, I believe, first broke away from the 7-per-cent. tradition, and for a considerable time their work was hardly appreciated. Amongst their opponents I was most keen; but on this point, at all events, I have for a considerable time been a convert to their views.

Yours truly,

August 8.

ERNEST J. PARRY.

SIR.—We note a letter in your last week's issue, signed by Mr. E. J. Parry, in which he raises the interesting question of the percentage of citral in lemon oil. This matter is, of course, of great interest to us, as our Mr. Child, in conjunction with his late colleague, Mr. Burgess, of the London Essence Company, was the first to point out in *THE CHEMIST AND DRUGGIST* (August 26, 1899), published as a communication from the London Essence Company, the absurdity of the certificates of analysis of lemon oil then issued by various chemists. In this article they pointed out that the probable percentage of citral in lemon oil was about 4 per cent., and used as an argument proving this the very one Mr. Parry now puts forward as conclusive. We trust that Mr. Parry has inadvertently overlooked that the priority of this work belongs to Messrs. Burgess and Child. In reply to the article just mentioned, Mr. Parry wrote a letter to the *C. & D.*, September 2, 1899, in which he mentioned that

Makers of terpeneless and concentrated oil of lemon only obtain 4 to 5 per cent. of total flavouring-matter, of which only a portion is of an aldehydic nature. This surely has no direct bearing on the matter, for no manufacturing process, especially one dealing with so unstable a body as citral, can be compared with an analytical process within such narrow limits.

Mr. Parry, in this reply, ignored the fact that Messrs. Burgess and Child stated in the article mentioned that they had made both experimental and practical distillations; and it is further significant that on March 8, 1900, Mr. Parry wrote for your paper an article on the estimation of the citral in lemon oil, in which he advocates the previously "condemned" method of concentrating lemon oil prior to arriving at the percentage of citral. In this communication he recommends the use of cyanacetic acid as a reliable absorbent for citral. This method Messrs. Burgess and Child, in a paper read before the Society of Chemical Industry in December, 1901, proved was not only useless as described by Mr. Parry, but (even when the precaution of "distilling the residue" was taken) was, as a chemical reaction, absolutely unreliable, and gave invariably much too high a figure. At the same time, we think that great credit is due to Mr. Parry for having come forward, after fully realising the absurdity of the data of the old school, to protest against "secret methods" of analysis based upon data given by irresponsible persons and firms who publish so-called "research work" on essential oils, and give only the vaguest particulars of their work.

Yours faithfully,

THE "ESSENTIALS" COMPANY.

Cheshamfield House, 86 Great Tower Street, August 12.

SIR.—I can fully endorse Mr. Parry's statements with regard to the normal percentage of citral in lemon oil. In the preparation of terpeneless oil of lemon I have found it impossible to obtain a yield exceeding 5 per cent., the

finished product containing from 45 to 50 per cent. of citral. Of course, a certain amount is lost, notwithstanding every precaution, during concentration, but it is obvious that the percentage of citral in imported lemon oil certified genuine does not usually exceed $3\frac{1}{2}$ per cent. Various processes for its estimation have been used, the most common being by the use of sodium bisulphite, and Messrs. Burgess and Child, in an excellent paper read before the Society of Chemical Industry in December, 1901, gave the results of numerous experiments, proving beyond doubt that the proportion of citral in lemon oil does not normally exceed 4 per cent.

Yours faithfully,

43 Southwark Street, S.E., August 11. C. T. BENNETT.

SIR.—It is with considerable satisfaction to ourselves that we read the protest by Mr. E. J. Parry in your issue of August 8 regarding lemon oils certified to contain 7 per cent. citral. Readers of the *C. & D.* will remember that four years ago (*C. & D.*, August 26, 1899) we pointed out that it is impossible for any normal lemon oil to contain 7 per cent. of citral—i.e. total aldehydes—bringing forward several arguments to prove this, with which, we are pleased to note, Mr. Parry is now in complete agreement. Our own deductions were not at the time very generally accepted by essential-oil analysts, especially those whose work lies principally in the analysis of Sicilian oils. We have in no way altered our view from that then expressed and repeated on several occasions elsewhere; in fact, we would incline to put the figure even lower than 3.5 per cent. We thoroughly endorse Mr. Parry's remarks, and shall continue to do all in our power to promote the rational figures being given on certificates with guaranteed oils.

Yours faithfully,

LONDON ESSENCE COMPANY.

(H. E. B.)

August 11.

SIR.—I have read with considerable interest Mr. Parry's letter on "The Citral Value of Lemon Oil" in the last issue of your journal, and am happy to find him raising his voice in protest against the more or less established custom of certifying to 7 or 8 per cent. of aldehydic constituents. The argument based on the yield of terpeneless oil obtained by manufacturers and the proportion of aldehydes contained therein is a very strong one. More than two years ago I made an exhaustive series of experiments with lemon oils of known origin and of undoubted genuineness, as well as with artificially prepared solutions of citral in rectified lemon-oil hydrocarbons, the results of which satisfied me that the proportions of citral which are regularly certified to by some chemists in normal lemon oils do not in fact exist. In the course of a discussion which followed the reading of a paper on "The Lemon-oil Industry" before the Society of Chemical Industry by Messrs. Burgess and Child in December, 1901, Mr. Parry, while unable to assent to the lower numbers given by the authors, yet expressed his opinion that the results frequently given were far too high, and it is interesting to find that his subsequent experience has more than justified that view. My own experience has thoroughly convinced me that proportions such as are constantly certified to do not exist in any normal genuine oil, and in the interests both of commercial honesty and of the profession of analytical chemistry it is to be hoped that the protest which has been voiced by the chemists of the London Essence Company, as well as by Mr. Parry and others, may result in the issuing of analytical certificates more in accordance with truth. It need hardly be remarked that the chemical profession does not recognise any such thing as a secret analytical process; and, if it should still be contended that 7 to 8 per cent. of citral is a normal result, then it is incumbent on those who make such statements to describe in detail the methods by which it has been obtained, in order that it may, like all other analytical processes, be subjected to the wholesome influence of skilled criticism.

Yours faithfully,

8 Duke Street, Aldgate, E.C.,

ALFRED C. CHAPMAN.

August 13.

Conference Delegates.

SIR.—I notice that the following names from the North Kent Chemists' Association were omitted from the list of delegates attending the meeting of the Pharmaceutical

Conference at Bristol—viz., D. U. Still (Vice-President), R. Feaver Clarke (Secretary), and A. Goldthorpe.

Yours truly,
D. U. STILL.
36 Church Street, Woolwich,
August 9.

[The names were not given in to the Secretaries of the Conference.—Ed.]

The Sale of Poisons.

SIR,—In your issue of August 7 I noticed an "explanation" by Mr. Boot as to the circumstances under which I was prosecuted for the sale of poisons at Walsall. I was instructed not to sell poisons, but no mention as to stocking same. The company knew I was selling them daily, for they received my counter-books twice weekly, with name of goods sold. They executed my orders, and knew perfectly well I was selling patents and drugs making me liable. Further, they sent me, without an order, a number of their proprietary preparations (bearing another name) containing scheduled poisons. Now, Sir, what were they sent me for if not to sell? so that the instructions regarding the sale of poisons at 25 Park Street, Walsall, will not hold water. I accept the sympathy for what it is worth. The company wrote for all the correspondence concerning the Society and myself, and one week before the case came on for hearing they sent me the following, which is a copy of their letter:

You must take your own course as to defending the action of the Pharmaceutical Society against yourself. So far as we are concerned, we are so dissatisfied that we have come to the conclusion that your engagement with us must terminate. We believe on the facts we could legally close your engagement with us without notice, but under the circumstances are willing to pay you a month's salary in lieu of notice, cheque for which we enclose herewith, on receipt of which you will be at liberty immediately. We enclose your papers herewith.

Now, Sir, when Mr. Jesse Boot engaged me four and a half years ago, I had taken the management of the shop at 25 Park Street, Walsall, for over nineteen years; the business of that shop naturally followed me to Boots' branch opposite. This is the world's sympathy, leaving me stranded after thirty-two years (since 1871) in the trade, with a family, and my health very precarious. Apologising for taking up so much of your valuable space, but I felt, after the company's treatment, there was an answer due from

Yours faithfully,
58 Earl Street, Walsall. HOWARD JAMES.

Halving the Major.

SIR,—The proposed alteration of the Major examination regulations came as a surprise to most members of the Society. Putting aside the injustice that men who will pass the examination of the future in two subjects will be on a level with men who passed in four, is the proposed division desirable? There seem to me to be strong arguments against it. Firstly, the only advantage of possessing the Major certificate lies in the fact that the holder has (or should have) not only a deeper knowledge, but greater range of subjects than the Minor man. This will be done away with by the new proposals. Secondly, How can a man know *materia medica* at all well without a deeper knowledge of chemistry and botany than he gets for the Minor examination. Thirdly, Of what value will a deep mathematical knowledge of physics be to a pharmaceutical chemist? The object of the Major examination was to make a competent pharmacist, not a specialist in physics. Fourthly, Suppose a man does specialise in chemistry and physics, what use are they going to be to him? Is the future Major man going to pose as a professor of chemistry, physics, or botany? or will he be preferred to a man with a University degree in the subjects? No; certainly not. The pharmaceutical examinations will never be recognised outside their own calling. If the Board wants to alter the examination, rather let the number of subjects be slightly extended than diminished. For instance, no one can over-estimate a knowledge (it need not be a deep one) of biology in these days of animal extracts and serums.

Yours truly,
39 Bristol Road, Edgbaston. E. C. BENNISON.

Miss E. M. CUTFIELD has been appointed as dispenser at the West Ham Union Infirmary.

Information Wanted.

- 120/12. Who makes "Giant" cement?
- 119/23. Who supplies Corlies' phosphorus pills?
- 121/4. Where can the "Primo Optical Outfit" be obtained?
- 98/26. "Salamander" brand antimony; refiners or shippers of.
- 120/54. Who are the makers of vaseo-glycerin sheep dip or maggot-lotion?
- 120/57. Name and address of agents for Hayden's viburnum compound.
- 119/23. Address of Mr. Joseph Hurksman, proprietor of Hurksman's asthma-reliever.
- 119/19. Address of manufacturer of auto-masseur (scalp-invigorator) and Kapp's antistain (or antisation) soap.

Marriages.

FORBES—BULLOCK.—At the Windsor Hotel, Glasgow, on August 5, by the Rev. John Fairley, minister of Larbert and Dunipace, John Johnstone Forbes, chemist and druggist, Denny, N.B., to Agnes Brown, elder daughter of Mr. William Bullock, Denny.

FRASER—CAMPBELL.—At the Alexandra Hotel, Glasgow, on August 5, by the Rev. John Baird, B.D., Helensburgh, John Fraser, chemist and druggist, Helensburgh, to Janet Sabiston, eldest daughter of the late Mr. John Campbell, Carcaston, Hamilton.

IRONMONGER—HUGHES.—On August 10, at St. John's Church, Nottirg Hill, W., Herbert Lovell Ironmonger, chemist and druggist, Chiswick, to Janet youngest daughter of Mr. S. T. Hughes, of Oxford.

WALTON—SMITH.—On August 4, at St. John Baptist Church, Owlerton, by the Rev. H. A. Goodwin, Vicar, Ernest Allison, only son of Mr. Henry Walton, chemist, Northenden, to Elizabeth (Lizzie), youngest daughter of Mrs. Hannah Smith, of Sheffield.

Deaths.

BAILEY.—At North Walsham, Norfolk, on August 2, Mr. George William Bailey, chemist and druggist, aged sixty-one.

BAILEY.—At Brown Royd, Bradford, on June 30, Mr. John Townsend Bailey, chemist and druggist.

BALFOUR.—Dr. George Balfour died at his residence at Colinton, on August 9. For a number of years Dr. Balfour, was one of the King's physicians-in-ordinary for Scotland. As a teacher he held a high position, and his clinical instruction course in Edinburgh was one of the features of the medical training there. He was an authority on diseases of the heart. Dr. Balfour, was the uncle of the late Robert-Louis Stevenson, the novelist.

FARRALL.—At Paarl, Cape Colony, on July 20, Mr. J. C. B. Farrall, of Messrs. Hutchinson & Farrall, chemists, Paarl, aged forty-six.

GRIEVES.—At Seaforth, on July 31, Mr. George Grieves, chemist and druggist, Seaforth, formerly of Liverpool, aged seventy-four.

MARTIN.—At Ashburton, South Devon, on July 20, Mr. John Woolcock Martin, pharmaceutical chemist, aged thirty-one.

MATHEWS.—At Kensington, on July 31, Mr. William Mathews, chemist and druggist, formerly of Merton Road, Wandsworth, S.W., aged fifty-five.

STOCKER.—At 1 East Southernhay, Exeter, on August 12, Mr. George Stocker, chemist and druggist, aged forty-two. Mr. Stocker was President last year of the Exeter Association of Chemists and Druggists, but owing to ill-health he was unable to carry out the duties of the office to his satisfaction. He succeeded several years ago to the business carried on previously by Mr. Passmore, and some forty years ago by Mr. Palk. He was a careful dispenser and by his industry had increased the prosperity of this old-established business. He leaves a widow and family.

Trade Report.

NOTICE TO BUYERS.—The prices given in this section are those obtained by importers or manufacturers for bulk quantities or original packages. To these prices various charges have to be added, whereby values are in many instances greatly augmented before wholesale dealers stock the goods. Qualities of drugs and oils vary greatly, and higher prices are commanded by selected qualities even in bulk quantities. It would be unreasonable for retail buyers to expect to get small quantities at anything like the prices here quoted.

42 Cannon Street, London, E.C.: August 13.

THE demand for drugs and chemical continues quiet, there being few alterations in prices. As anticipated, mercurials have been reduced in order to meet competition. Quinine continues very quiet, but closes rather firmer on account of small bark-shipments from Java. Menthol for delivery has been sold at lower prices, but the spot market is fairly steady. Cascara sagrada and senega continue the advance noted last week, and more activity has been shown for parcels to arrive. Golden seal is also slightly dearer. There has been an unexpected large arrival of Rio ipecacuanha, which has somewhat startled the market. The market has been cleared of the Johore description, but a further parcel is now landing; and the principal holder of Cartagena has raised his price 3/4. Opium is firm, with a small demand at recent prices. Shellac is, however, the feature of the week, a large business (mostly speculative) having been done at considerably advanced rates. Cream of tartar and foreign tartaric acid are both a shade easier, owing to lack of business. Sulphur has advanced on the spot, owing to hop-growers' requirements. The principal changes of the week are as given below:

Higher	Firmer	Easier	Lower
Cascara sagrada	Golden seal	Acid, tartaric	Arrowroot
Cocoa-butter	Ipecac. (Cart.)	Ammonia sulphate	Hyd. biniodid.
Mace (W.I.)	Pepper, white	Benzols	Menthol (c.i.f.)
Nutmegs (W.I.)	Quinine (sec. hands)	Cream of tartar	Mercurials
Oil, turpentine		Ginger (Jamaica)	
Senega		Oil, cod-liver	
Shellac			
Sulphur			

Arrivals.

The following drugs, chemicals, &c., have arrived at the principal ports of the United Kingdom from August 5 to 12, inclusive: Acetate of lime (@ New York) 2,161; acetone (@ Fiume) 110, (@ Stettin) 16; acid, acetic (@ Fiume) 38, (@ Ghent) 30, (@ Rotterdam) 89 pkgs., (@ Terneuzen) 85; acid, boric (@ Paris) 150, (@ Leghorn) 10; acid, citric (@ Messina) 20; acid, carbolic (@ Amsterdam) 15; acid, lactic (@ Hamburg) 10, (@ Rotterdam) 9; acid, sulphuric (@ Amsterdam) 90; acid, tartaric (@ Hamburg) 6, (@ Rotterdam) 12, (@ Bari) 176; aloes (@ Hamburg) 15 cs.; areca (@ Colombo) 44; arsenic, red (@ Antwerp) 30, (@ Oporto) 42, (@ Tréport) 40; benzoin (@ Penang) 20; bleaching-powder (@ Tréport) 53, (@ Hamburg) 23; borax (@ Hamburg) 28, (@ Havre) 100; Calahar beans (@ W.C. Africa) 5; camphor (@ Hong Kong) 9; cassia lignea (@ Hong-Kong) 100 cs.; chamomiles (@ Ghent) 10, (@ Antwerp) 6; canary-seed (@ Mazaga) 123; cardamoms (@ Bombay) 14; casein (@ Rotterdam) 10; cinchona (@ Amsterdam) 32; cloves (@ Bombay) 18; cochineal (@ Grand Canary) 10, (@ Tenerife) 50; cod liver oil (@ Aalsund) 27, (@ Bergen) 8, (@ Halifax) 46, (@ St. John's) 71 pkgs.; cumin-seed (@ Calcutta) 22; cream of tartar (@ Bordeaux) 28, (@ Tarragona) 10, (@ Marseilles) 32; croton-seed (@ Colombo) 18; dragon's blood (@ Penang) 6 cs.; drugs (@ Rotterdam) 26, (@ Boulogne) 20, (@ Hamburg) 20 bls., (@ New York) 15, (@

Trieste) 48; essential oils (@ Amsterdam) 10, (@ Boulogne) 10, (@ Messina) 48, (@ Ostend) 2, (@ New York) 10; formalin (@ Hamburg) 5; galls (@ Marseilles) 49; gentian (@ Marseilles) 190; ginger (@ Bombay) 131, (@ W.C. Africa) 220, (@ Hong-Kong) 300; glycerin (@ Sydney) 60 drms.; gum arabic (@ Bombay) 130; gum, unenumerated (@ Bombay) 229, (@ Suez) 15, (@ Marseilles) 75; honey (@ Auckland) 26 cs., (@ Chili) 571 pkgs., (@ Paris) 8, (@ Jamaica) 65; insect-powder (@ Trieste) 14; ipecacuanha (@ Monte Video) 110; laurel-leaves (@ Ostend) 28; lime acetate (@ Philadelphia) 711; lime juice (@ Kingston, W.I.) 16 puns.; liquorice-root (@ Catania) 13; liquorice-juice (@ Marseilles) 15 cs.; menthol (@ Japan) 10; nuxvomica (@ Madras) 1,332 bgs. in tr.; oil, castor (@ Hamburg) 30 bls., (@ Leghorn) 10, (@ Venice) 40 cs.; oil, peppermint (@ Bremen) 10; oil, wood (@ W.C. Africa) 29; olibanum (@ Bombay) 8; opium (@ Bombay) 20, (@ Constantinople) 92, (@ Calcutta) 70; pepper (@ Havre) 723; poppy-heads (@ Antwerp) 3; pot. caustic (@ Tréport) 18 dms., (@ Bremen) 16; pot. chlorate (@ Hamburg) 20; pot. cyanide (@ Hamburg) 65; pot. permang. (@ Hamburg) 20; quicksilver (@ Malaga) 6; quinine (@ Havre) 20 cs.; rhubarb (@ Shanghai) 24; roots (@ Marseilles) 278; rose-leaves (@ Marseilles) 7; saccharin (@ Antwerp) 1; sal ammoniac (@ Amsterdam) 60; saltpetre (@ Hamburg) 40; senega (@ Bombay) 111; shellac (@ Calcutta) 1,299, button lac 308; soda caustic (@ Antwerp) 106 drms.; soda chlorate (@ Hamburg) 14; soda crystals (@ Ghent) 650, (@ Antwerp) 300; spermaceti (@ New York) 80 cs.; sugar of lead (@ Stettin) 28; sulphur (@ Catania) 700 tons 192 bls. 1,090 bgs. 84 cks.; tamarinds (@ Calcutta) 19; tartar (@ Messina) 24, (@ Rotterdam) 4, (@ Rouen) 75; turmeric (@ Bombay) 753 bgs. 521 bxs.; vanilla (@ Auckland) 15 pkgs.; wax, bees' (@ Chili) 199, (@ Leghorn) 22, (@ Hamburg) 62, (@ W.C. Africa) 38, (@ Rangoon) 30, (@ Tangier) 15; wax, Carnauha (@ Hamburg) 23; wax, ceresin (@ Rotterdam) 15, (@ Stettin) 20, (@ Hamburg) 43, (@ Cologne) 51; wax, unenumerated (@ Calais) 10, (@ Hamburg) 48, (@ Havre) 50.

Customs Duties and Drawbacks.

The Board of Customs have issued a General Order (52/1903) embracing a complete list of Customs duties, drawbacks, warehousing-charges on customable goods and British spirits, and the rate of duty on British spirits. It includes all the changes up to the present date, and General Order (6/1902) is cancelled accordingly.

Foreign Trade in July.

The figures relating to the foreign trade of this country during July reveal little of interest, although they bear testimony to the fact that we are still holding our own. Imports increased by 1,566,000l., or 3.32 per cent., which is accounted for by increased purchases of food and drink. Exports, on the other hand, were stationary; to be exact, they show a decrease of 150,000l. on the month. The exports of chemicals, drugs, dyes, and colours fell by 19,600l. on a total of 921,000l. for the month. On the seven months' trade in these products there is still an improvement to the extent of 333,000l. as compared with 1902. For the first time for many months the value of exports of medicines (comprising drugs and medicinal preparations) declined, the exports for July being 103,600l., as compared with 114,200l. for the corresponding month of last year. On the seven months' trading there is still a balance to the good of 26,000l. on a total of 803,000l. Glycerin exports last month amounted to 8,992 cwt., or 19,824l.; and the exports of British quinine and quinine salts were stationary at 72,09 oz. So far this year we have exported 416,599 oz. (25,403l.), compared with 365,143 oz. (25,288l.) exported during the first seven months of 1902. We also exported 12,247 oz. of foreign quinine and quinine-salts in July, against 18,800 oz. in July, 1902; for the seven months the exports amount to 169,871 oz., against 94,032 oz. for the corresponding period of 1902. The imports of quinine show a material shrinkage so far this year, we having only imported 293,773 oz., compared with 898,704 oz. during the first seven months of 1902. Last month we only imported 28,000 oz.—a decrease of 39,000 oz.

Japanese Products.

In our issue of July 25 we published a report by Messrs. Sachsse & Co., of Leipzig, which they had received by the Yokohama mail of June 11, 1903, according to which the Japanese pepper-mint-crop was estimated at 200,000 kins or 125,000 kilos. Since then later reports have come to hand of quite a different tenor. The *Kobe and Osaka Trade Review* of June 27 estimates the crop at 150,000 kins or 94,000 kilos only, provided that no heavy storms damage the crop, as was the case last year. Messrs. Sachsse also report quite correctly that the July crop produces 10 per cent. only of the year's crop, that 40 per cent. is produced in September and 50 per cent. in November; but then last year the first and second crop had been safely gathered, whilst the third and most important suffered great damage through heavy storms. The first news about this disaster, which caused such a rapid rise in prices, only arrived in London on October 10 and 13,

1902. Therefore any statement as to this year's crop can, under the most favourable circumstances, be based only on the area planted, and provided that it will not suffer by the weather. The *Kobe and Osaka Trade Review*, under date of July 4, reports that, "according to an advice from a certain dealer who has made a round tour over the peppermint-producing districts, the crop for the new season will in all probability not be so large as the acreage previously promised, as in some places it has suffered from storm and damage by insects." As regards Japanese vegetable-wax, the Kobe market has tended weaker again. It is reported that some 200 to 300 cases of No. 1 have been sold at the cheap price of \$30.50 per picul, showing a fresh drop of some 50c. A report says that the manufacturers in the producing district have resolved not to sell at less than \$30, "laid down in Kobe." At Osaka, both crude and refined wax tended weaker again. Refined is quoted \$29.50 for good, and common at \$23 to \$29. The Kobe market for isinglass continued quiet, No. 1 being quoted \$80, No. 2 \$75, and "Extra" \$85 per 100 kin. The Kobe ginger-market has been quiet and unchanged. The price in the producing district has been firmly maintained at a rate equivalent to \$11.80 to \$12 laid down in Kobe. In Japanese galls no business has been done in Kobe for some time. Sellers are, however, firm at \$23.

ACETANILIDE is quoted at from 8½d. per lb. for 1-cwt. lots, to 9½d. for smaller wholesale lots.

ACID, TARTARIC.—Foreign is rather easier at 1s. 1d. per lb., and English is unchanged at 1s. 1½d.

AGAR-AGAR.—Sales have been made at 1s. 5½d. per lb. spot.

AMMONIA.—Liquor of 0.880 strength is quoted at 3½d. per lb. net in Winchester, and 3d. net in drums in small wholesale lots. Carbonate is unchanged on the basis of 3½d. for lump in casks, and 3½d. for jars or tins.

ANTIMONY.—Black sulphide has been sold at 12s. per cwt.

ARROWROOT.—Rather easier in auction, St. Vincent selling at 2d. to 2½d. per lb. for good manufacturing, and 3¾d. for Owia.

BELLADONNA-ROOT.—Good quality continues scarce; the lower grades are plentiful, however, at from 35s. to 40s., c.i.f. New-crop Leaves are quoted 45s. to 47s. 6d., c.i.f.

BENZON.—Subsequent to the auctions, ordinary false-packed Sumatra seconds were sold at from 4l. 15s. to 4l. 17s. 6d., and inferior at 4l. 5s. per cwt. 6l. 7s. 6d. has been paid for good and 6l. 10s. is wanted. Small sales of Palembang have also been made at 35s.

BUCHU.—Fair greenish round leaves have been sold at 9½d. per lb.

CAMPHOR.—In crude Japanese a small spot business is reported at 177s. 6d. per cwt.

The British Consul at Tamsui, North Formosa, reports that the value of camphor exported from that island in 1902 was 387,349l. (5,253,411 lbs.), as against 245,195l. in 1901, or a rise of nearly 58 per cent. on the total of the preceding year. In addition to this, camphor oil to the amount of 95,993l. (2,740,713 lbs.) was sent to Japan, being, however, 42,115l. less in value than the export of the same product in 1901. The contract for the sale of camphor under the monopoly expired on March 24, 1903, but has been renewed for a further term of three years. An attempt has been made by the Formosa Government to monopolise the camphor produce of the Fokien Province in China, and a late member of the Formosa Government resides at Amoy, in that province, for purposes of supervision; but even if a monopoly were justifiable under existing circumstances, it is doubtful, says the Consul, if these efforts can meet with success on account of the scarcity of material and contingent expenses. The supply is about 8,000 lbs. a month, and none of it has so far been brought, as suggested, to Formosa for refining.

CANTHARIDES.—Hungarian flies of the new catch are quoted 2s. 2d. per lb. c.i.f. Sound Chinese are scarce, and there are none coming forward.

CASCARA SAGRADA continues to advance, and a fair amount of business has been put through since our last report. In one quarter, sales amounting to 25 tons have been made at 40s. per cwt. c.i.f. for September-November shipment per sailer from San Francisco, which practically means that the goods will not arrive until about March next year; the B/L also contains a "strike" clause. For this position 45s. is now quoted. For shipment "overland"—i.e. per rail and steamer *via* New York, 45s. to 47s. 6d. has been

paid, and 50s. is now wanted. On the spot, holders have advanced their prices, in one instance 65s. being quoted for three-year-old bark.

CHAMOMILES.—Fair No. 1 Belgian flowers of the new crop are quoted at from 51s. to 56s. per cwt., according to delivery. The quality much depends on the weather now prevailing, as the crop is now being gathered. As usual, it is said France is securing the bold white flowers.

CINCHONA.—At the periodical auctions on Tuesday, seven brokers brought forward catalogues aggregating 1,439 packages, against 715 packages offered at the previous auction in July. There was a fair demand, and about half the offerings were sold at fully the last London sales rates; the average unit being 1¼d., and the parity of the last Amsterdam sales 1⅓d.

The following table shows the amount of bark offered and sold:

	Packages Offered	Packages Sold
East Indian cinchona	862	651
South American cinchona	333	—
Java cinchona	130	14
Ceylon cinchona	114	21
	1,439	686

The following are the approximate quantities of bark purchased by the various buyers:

	Lbs.
The American factories	63,490
The Frankfort-on-Main and Stuttgart factories... ..	39,188
Messrs. Howards & Sons	23,166
The Brunswick factory	17,185
The Imperial Quinine factory	15,267
The Mannheim and Amsterdam factories	1,726
Druggists, brokers, &c.	17,850
Total quantity sold	182,872
Bought in or withdrawn	151,636
Total quantity offered	337,538

The following prices were paid:

CEYLON.—Ledgeriana, good stem chips, 4½d.; ditto renewed, 5d. per lb.

JAVA.—Hybrid branch, 4½d. per lb.

SOUTH AMERICAN.—Sixty-four bales Bolivian cultivated Calisaya were bought in, and a parcel of 266 bales soft Columbian (Z O), imported in 1883 and 1885, was also bought in, from 2½d. to 3d. per lb. being wanted.

EAST INDIAN.—Succirubra chips, 2¾d. to 3½d.; root, 2½d.; renewed, 3d. to 3½d.; chiefly crown siftings, 3½d. to 3½d.; branch and small chips, 1¾d. to 4d.; fair to good stem chips and shavings, 4½d. to 4½d., fine rich, 5½d. to 5½d.; root, common dull, 4½d. to 4½d., medium 5½d. to 5½d., rich 5½d. to 6½d.; renewed, medium 3½d., fair 4½d., good 5½d. Ledgeriana siftings, 1¾d.; branch, 1½d. to 4d.; root, 4½d. to 4½d.; rich, 6d. to 6½d. per lb.

The exports from Holland during the five months ending May amounted to

	1901	1902	1903
Tons	2,343	2,859	1,941

The shipments from Java for the half-month amount to 416,000 Amst. lbs., being small compared with the corresponding period of last year.

COCA-LEAVES.—Huanuco leaves are practically unobtainable on the spot; Truxillo are offered at 11d. per lb., which price may be shaded for quantity.

COCA-BUTTER.—In auction 25 tons of *Cadbury's* "A" brand sold at from 11½d. to 11½d. per lb., being ¼d. dearer.

COCHINEAL.—The prices of all qualities are now about 50 per cent. higher than at the corresponding period of last year, owing to the continued decrease in arrivals.

CREAM OF TARTAR is rather easier, best white powder being offered on the spot at 86s. per cwt.; 98-per-cent. powder is quoted 88s. to 89s.

The exports of tartar and wine-lees from Spain during the four months ending April, 1903, amounted to 3,092 tons, against 3,121 tons for the corresponding period of 1902, and 3,556 tons for 1901.

DRAGON'S-BLOOD.—Four cases of *Reed* have arrived this week.

FORMALDEHYDE is quoted at from 51s. to 52s. per cwt. for 40-per-cent. volume in carboys, according to quantity.

GALLS.—Sellers of Chinese ask 52s. 6d. c.i.f. London for

parcels near at hand, and for October-November shipment 5½s. 6d. is quoted.

GAMBIER.—*Cubes* are quiet, with small sales at from 38s. to 39s. per cwt.

GOLDEN SEAL.—Spot sales have been made at 2s. 5d. per lb. net, a slight advance on previous prices.

GUM ARABIC.—A consular report on the trade of Port Said and Suez during 1902 states that the quantity exported was 4,695 tons valued at 107,257l. E, against 3,567 tons valued at 146,438l. E. in 1901. One-fourth of the above quantity was sent to France, and most of the remainder was distributed between Germany, the United States, and the United Kingdom.

HENBANE.—New foreign is quoted 32s. per cwt., c.i.f. terms.

HYD. BINIODID.—Makers have reduced their prices by 2d. per lb., and now quote 7s. 9d.

HYDROKINONE.—Prices have been somewhat reduced lately; best makes in bulk are quoted from 4s. to 4s. 3d. per lb.

IPECACUANHA.—The s.s. *Thames* has arrived with 110 bales of Rio ipecacuanha from Monte Video. This arrival has startled the market somewhat, but it is not anticipated that any serious decline will follow. A bale or two of Rio has been sold at 4s. 10d. since the auctions, and the principal holder of Cartagena is now asking 4s. 3d. for single bales. All the *Johore* was cleared off the market immediately after the auctions last week, some being bought on United States account. A further shipment from the Straits Settlements, valued at 365l., is about landing.

MENTHOL.—For October-November shipment sales of Kobayashi crystals have been made at 15s. 9d. per lb. c.i.f. There is very little on the spot, and holders ask 22s.

MERCURIALS.—As was expected, the English makers have reduced their prices in order to prevent German competition. Their list prices, and under 2-cwt. lots, now stand as follows: Hyd. biclor., 2s. 5½d.; hyd. chlorid., 2s. 10d.; hyd. nit. oxid., 3s. 2d.; hyd. ammon. chlor., 3s. 3½d.; hyd. sulph. alb., 2s. 5d.; hyd. sulph. nig., 2s. 4d.; hyd. oxid. flav., 3s. 4½d. per lb. Two-cwt. lots and under ten cwt. are subject to ½d. per lb. reduction.

MYRRH.—A shipment of 54 bales from Aden is due shortly.

OIL, CASSIA, remains slow of sale at from 2s. 2d. to 2s. 11d. per lb., according to analysis.

OIL, CASTOR.—For prompt delivery August-December Hull make is quoted at 19l. 10s. per ton for first pressing, and October-December delivery 17l. 10s. for second pressing. January-June deliveries are quoted at 19l. 12s. 6d. for first and 17l. 12s. 6d. for seconds, ex wharf London. Belgian for August-December delivery is offered at 19l. 10s. for firsts and 17l. 5s. for seconds.

OIL, CLOVE, has been somewhat easier lately; B.P. quality is obtainable at 2s. 5d. per lb.

OIL, COD-LIVER.—Writing on July 8, our Bergen correspondent reports that the cod-liver-oil market is very dull, it being impossible to effect sales at the moment. Finest non-congealing is quoted at from 450s. to 480s. per barrel, f.o.b. Bergen. The exports from Bergen to date amount to 1,514 barrels, against 5,514 barrels at the corresponding period of last year.

OIL, EUCALYPTUS, has been in fair demand. Australian of B.P. quality is offered at 1s. per lb. net in cases.

OIL, GERANIUM.—Very little *Réunion* is obtainable on the spot, and for pure 14s. to 15s. per lb. is nominally quoted.

OIL, PEPPERMINT.—Quiet. In American HGH there has been more inquiry at last week's reduced prices, but holders ask quite 6d. premium—viz., 11s. 6d. to 11s. 9d., according to quantity. Kobayashi brand of Japanese is quoted 5s. 9d. to 6s., spot.

OIL, SANDALWOOD.—English distilled is offered at 11s. per lb.

OIL, TURPENTINE, has been in good demand at higher prices, American on the spot selling at from 4½s. 9d. to 40s. 10½d. per cwt.

OPIUM.—The London market keeps firm, but quiet, with further sales of Persian (to arrive on and on the spot at 10s. per lb. A few cases of Smyrna druggists' have also been sold at recent rates.

SMYRNA, July 31.—The sales for the week amount to 27 cases, including 25 old Karahissar t.q. at from 10s. 1d. to 10s. 2d., and 2 cases inspected Yerli at 11s. 1d. per lb., c.i.f., 14 cases of which were for local speculators. The large holders of old crop show no anxiety as to their holdings, and a rather important order has remained unexecuted. There is not a seller of new opium at the last prices, and as buyers are unwilling to accede to the higher rates asked, business is accordingly difficult to effect. A similar condition of things exists on the Constantinople and Salonica markets. The fall in the rate of exchange is also an impediment to business. The market closes firm with buyers, the arrivals of new opium in Smyrna amounting to 491 cases, against 2,060 cases at the corresponding period of last year. The total number of cases sold during July amounted to £80, of which 460 were for the United States, 29 for England and the Continent, and 191 for account of speculators. The Smyrna stock in first and seconds is now 4,321 cases, against 3,646 at the same period last year, and in Constantinople 474 cases, against 614 cases. The official estimation of the Turkey opium crop for 1903 now places it at 2,720 cases, divided into the following: Konia vilayet 650; Broussa vilayet, 800; Aidin vilayet, 375; Angira, Sivas, Mamouretougat-Aziz and Salonica vilayets, 625 cases.

CONSTANTINOPLE, August 7.—After the recent heavy purchases in Smyrna a quiet tone has naturally set in, and prices have fallen somewhat, but as soon as it is generally realised that the yield cannot exceed 3,000 cases, we fail to see what will prevent prices going up to the level of a fortnight back, and may be higher. The week's sales amount to 4 cases "druggists'" at 8s. 9d. per lb., f.o.b.

QUININE.—The small bark shipments for the first half of the month have given a rather firmer tone to the second-hand market to-day, and a small business has been done at 11d. per oz. on the spot, and 11½d. to 11¾d. for October delivery. September delivery had been sold on Wednesday at 10¾d., and spot at 10½d.

The exports of quinine, quinine preparations, &c., from Germany during the five months ending May were as follows:

	1901	1902	1903
Kilos. ...	88,700	81,400	61,600

SAFFRON.—Adverse reports concerning the outlook for the new crop continue to be received from Valencia, and in consequence the market here remains firm. From 29s. to 32s. is quoted in London.

The exports from Spain during the four months ending April amounted to

	1901	1902	1903
Kilos. ...	25,864	26,225	16,059

The British Consul at Alicante reports that during 1902 17,000 lbs. of saffron were exported from that port. Of this quantity about 13,000 lbs. appear as shipped to France, but the greater part of this was sent to Marseilles in transit for reshipment to Bombay.

SARSAPARILLA.—Practically all the offerings of grey Jamaica and Lima-Jamaica have been cleared at the auction limits of last week. A new arrival of 13 bales red native Jamaica has taken place.

SENEGA.—Immediately after the close of our last report the market took another upward turn, and a fair amount of business has been done at prices ranging from 2s. 7d. to 3s. 2d. per lb., c.i.f., and it was doubtful on Wednesday if anything more was obtainable at the higher figure. On the spot the market has been inactive, the nominal price being 3s. 6d.

SENNA.—The s.s. *Persia* is due on August 15 with 190 bales of Tinnevely leaf.

SHELLAC.—Since we closed our last report the market has advanced daily in all positions, and up to Wednesday the price of fair Orange TN had risen quite 12s. per cwt., holders on that day quoting 155s. to 156s. per cwt., but the high prices asked and indifferent sellers have checked business. There has been a good request for Buttons, fine BLI having sold at 157s. 6d., fair thirds 130s., and ordinary to good circle two's at 124s. to 130s. For arrival prices have advanced about 12s. up to Wednesday, July-September shipment selling up to 148s., and October-December at up to 148s., c.i.f. "Futures" have also been dealt in largely, the market scoring an advance of 3s. to 4s. daily. It is estimated that some 8,000 cases have been sold this week in the delivery market, and the sales up to Wednesday included

August-September and October delivery at 157s., November 157s. to 158s., December 156s. to 158s., January 156s. to 153s., February 154s. to 155s., and March at 153s. per cwt.

SOY.—Business in new arrivals has been done at 1s. 6d. per gal.

SPICES.—In auction 181 barrels Jamaica *Ginger* were offered, of which 60 sold at full-up prices for good, which brought 52s. to 56s. Fair washed sold at 46s., and dull to medium washed at 39s. to 43s.; 19 bags of Bengal sold at 36s. for good, and 28s. for fair small. Of 90 cases Cochín offered, 9 sold "without reserve" at 43s. 6d. for very wormy selected. Medium and bold cut were bought in at 57s. 6d., small to bold medium at 55s., and unsorted Native cut at 52s. 6d. Fair rough washed was bought in at 35s., and 143 bags limes Japanese were bought in at 27s. to 28s. Privately retail sales of medium and small washed Cochín had been made at 32s. 6d. *Pepper*.—Of Tellicherry 100 bags sold without reserve at 6d. for fair, with one lot at 6½d. per lb.; 292 bags of Lampung sold without reserve at from 5¾d. for fair, part dusty with two lots at 5½d. Fine Saigon was bought in at 6½d. *White pepper* met with no demand, Singapore being bought in at 9¾d., and fair Siam at 9¾d. Privately Singapore on the spot is quoted at 9¾d. to 9½d. for fair, and fair Penang at 9½d. Of Pimento 25 offered, and 5 sold at 2¾d. for fair. Good bright Zanzibar *Cloves* were bought in at 5¾d., and of 25 cases Penang 15 sold at 8½d. for fair. A few bags of common dark Amboyna sold at 7½d. The market privately has been steady, but quiet, a few hundred bales of October-December delivery selling at 4¾d. to 4½d. Nyassaland *Chillies* sold at rather lower prices, 45s. to 47s. being paid for fine bright red, 43s. for good bright red, and 37s. for yellowish. West Indian *Mace* was rather dearer, 34 packages selling at 2s. 4d. for good bold, 2s. 1d. to 2s. 3d. for fair to good pale, 1s. 8d. to 1s. 10d. for broken, and 1s. 11d. to 2s. for ordinary red. West Indian *Nutmegs* were dearer, about 100 packages being disposed of. Penang, Singapore, and East Indian descriptions were bought in.

SULPHUR is dearer on the spot, owing to an active demand for hop dressing. There is now a great scarcity temporarily, but it might be possible to buy a little at from 7l. 10s. to 8l. for foreign flowers; for English, 10l. 10s. to 11l. is asked.

TURMERIC.—The recent large arrivals of Madras appear to have met with little demand. Sellers of Bengal ask from 12s. to 13s. per cwt., and for arrival 8s. 6d., c.i.f., is quoted.

WAX. BEES'.—American yellow pure (WHB brand) is quoted 8l. 5s. per cwt. net, and white at 9l. 5s. net, in lots of 5 cases.

Heavy Chemicals.

There is little new or of special importance to be noted regarding the heavy-chemical market, as general conditions remain practically unchanged from those mentioned in recent reports. Values are without fluctuation of particular moment.

SULPHATE OF AMMONIA, continuing very slow of sale, is easier at normal figures as follows: Beckton, 12l. 7s. 6d.; Beckton terms, 12l. 2s. 6d. to 12l. 5s.; London, 12l. 5s. to 12l. 7s. 6d.; Leith, 12l. 5s.; and Hull, 12l. 2s. 6d. to 12l. 5s.

ALKALI PRODUCE.—The manufacture of note in this department is the increased exports of bleaching-materials and soda compounds. Values are still low, and there is not much prospect of alteration or appreciable improvement. Bleaching-powder, 3l. 5s. to 3l. 15s. per ton for softwoods free on rails, and 3l. 10s. to 4l. 10s. per ton free on board, varying according to circumstances. Caustic soda is moving rather better at old rates, 76 to 77 per cent., 10l. 10s. to 10l. 12s. 6d. per ton; 70 per cent., 9l. 15s. to 9l. 17s. 6d. per ton; and 60 per cent., 8l. 15s. to 8l. 17s. 6d. per ton. Ammonia alkali, 58 per cent., continues in active demand, and is firm at unchanged figures of 4l. 10s. to 4l. 15s. per ton, free on rails at works. Demand for soda crystals is well maintained and is quite up to the average, f.o.b. Tyne, 62s. 6d. per ton, f.o.b. Liverpool, 67s. 6d. per ton. Bicarbonate of soda in steady demand at 6l. 7s. 6d. to 6l. 15s. per ton in large casks, f.o.b. Liverpool, and 6l. 15s. to 7l. 2s. 6d. per ton in 1-cwt. kegs. Salicake, with continued better demand, maintains its late firmer tone, at 22s. 6d. to 21s. per ton, free on rails, in bulk. Chlorates of potash and soda are steady, at 2¾d. to 2½d. per lb. Yellow prussiates of potash and soda have maintained more active demand, and prices are a trifle better. Potash, 5d. to 5½d., and soda, 3¾d. to 3½d. per lb. Sulphate of soda without change, at

27s. 6d. to 32s. 6d. per ton, free on rails, in bags. Hyposulphite of soda is quiet and prices rule low, 6-8-cwt. casks, 5l. to 5l. 10s. per ton; and 1 cwt. kegs, 5l. 15s. to 7l. 15s. per ton, according to quality or quantity, f.o.r. or f.o.b. Silicates of soda moving well at unchanged rates, 140° Tw., 4l. 2s. 6d. to 4l. 12s. 6d. per ton; 100° Tw., 3l. 12s. 6d. to 4l. 2s. 6d. per ton; and 75° Tw., 3l. 5s. to 3l. 15s. per ton, according to quality and quantity, f.o.b. Liverpool or Tyne, in usual casks.

Liverpool Drug-market.

Liverpool, August 12.

Business still remains very quiet, and but little doing.

CASTOR OIL is distinctly firmer, and nothing now can be obtained on the spot under 2½d., or perhaps to 2¾d. per lb. might be accepted for quantity, ex quay. First-pressure French is unaltered.

CASCARA SAGRADA is in good demand for re-export to the U.S.A., 45s. per cwt. being now the price of new, and almost any price for good old bark.

QUILLAYA is flat at 22l. 10s. per ton, and low prices are being named for forward shipment.

COD-LIVER OIL (NEWFOUNDLAND).—Notwithstanding the arrivals, there is no alteration in prices, from 12s. to 13s. per gal. being quoted for non-freezing and 8s. for congealable.

TARTARIC ACID.—Second-hand parcels are offering at 12½d. per lb., and some makers for quantity would be tempted to take this figure.

BALSAM COPAIBA.—Sales have been made at 1s. 6½d. per lb., which is about the value.

GUM GUAIACUM.—For a small lot offered at auction there were no bids, 11d. to 1s. per lb. being wanted.

GUM ACACIA.—Some business has been done in sorts at from 22s. to 32s. 6d. per cwt., according to quality.

CANARY-SEED is again firmer at 45s. per quarter, on the spot.

CARNAUBA WAX is unchanged at 70s. for grey, and 92s. 6d. for yellow.

German Drug-market.

Hamburg, August 11.

Business continues extremely quiet in drugs.

ASPHALTUM.—Syrian shows a rising tendency at 50m. for pieces and 40m. for splits.

CAMPHOR is firm but unchanged at 435m. per 100 kilos.

COCAINE in second-hands is quoted at 575m., which is a little under makers' price. Very little is offered.

CANTHARIDES are improving; the new crop is small; 575m. is the value.

ERGOT is advancing, as the scarcity is becoming general on the spot; 240m. per 100 kilos. is quoted.

MENTHOL is firm and extremely scarce on the spot at 52m., and for delivery 42½m. is quoted.

SENEGA is advancing, owing to scarcity reported from abroad; 700m. per 100 kilos. is asked.

LYCOPodium is scarce, and 490m. has been paid.

KOLA is in demand but scarce at 95m. to 100m. per 100 kilos.

JAPANESE WAX is firm, but business is restricted owing to the high values; 132m. to 135m. per 100 kilos. is the spot value.

GOLDEN-SEAL is firmer, and 540m. has been paid; 550m. is now asked.

STAR ANISEED is neglected at 665m. per 100 kilos.

GALANGAL is cheaper at 32m. per 100 kilos.

American Peppermint-crop.

The following report has been received by the London agents of the A. M. Todd Company:—"As we advised in our last letter, the indications at the time of its writing were for a very small yield, and further developments as distilling progresses seem to confirm our views. A couple of days ago we were advised by one of the largest growers in Van Buren County that from 25 acres of well-developed plants of this year's planting, from which we had expected to receive at least 25 lbs. per acre, only 240 lbs. was obtained, being only a trifle more than 9 lbs. per acre. We are also advised by another prominent grower that from 60 acres of plants, part of which had been conservatively estimated to yield at least 40 lbs. per acre, only 611 lbs. was obtained. The two results mentioned above are both from the Decatur district in Van Buren County. Other growers there seem to be faring no better than the two we mentioned, as one in particular, who has in previous years shipped largely to the New York market, has entirely abandoned distilling for the present, as there is not sufficient oil in the plants to defray his running expenses. Reports from the producing district in Northern Indiana and in St. Joe County, Michigan, are equally discouraging, and the small yield does not seem to be confined to any one locality. From a careful canvass of all the producing districts we have been obliged to reduce our estimate as to the probable size of the crop, and do not think now that it will greatly exceed, if any, the crop of last year."